z/OS

Infoprint Server Migration

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> **Note**
>
> Before using this information and the product it supports, be sure to read the general information in "Notices" on page 181.

Fourth Edition (April 2002)

This edition is a major revision of G544-5743-02. It applies to z/OS Version 1 Release 2, Program Number 5694-A01; to z/OS.e Version 1 Release 3, Program Number 5655–G52; to Infoprint Server Transforms Version 1 Release 1 Modification Level 1, Program Number 5697-F51; and to all subsequent releases and modifications until otherwise indicated in new editions or technical newsletters. Be sure to use the correct edition for the level of the product.

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Summary of Changes

The book contains information previously presented in G544-5743-02, which supports z/OS Version 1 Release 2.

New Information

- Information is added to indicate this book supports z/OS.e™.
- Chapter 3, "z/OS Version 1 Release 2 Overview" on page 13 summarizes enhancements introduced to Infoprint® Server for z/OS V1R2 in March, 2002. You must apply the PTFs listed as dependencies to use these enhancements.
  - Print Interface subsystem for batch applications
  - Infoprint Port Monitor for Windows® enhancements
  - IP PrintWay™ resubmit for filtering enhancements
  - IP PrintWay TCP/IP connection timeout enhancement
- Chapter 5, "Summary of Interface Changes" on page 109 summarizes interface changes introduced to Infoprint Server.

This book contains terminology, maintenance, and editorial changes. Technical changes or additions to the text and illustrations are indicated by a vertical line to the left of the change.

The book contains information previously presented in G544-5743-01, which supports z/OS Version 1 Release 2.

New Information

- Chapter 3, "z/OS Version 1 Release 2 Overview" on page 13 summarizes enhancements introduced to Infoprint Server for z/OS V1R2 in December, 2001. You must apply the PTFs listed as dependencies to use these enhancements.
  - IP PrintWay e-mail support
  - Print Interface remote transform support for IBM® Infoprint Color 130 Plus printer
- "Actions Required for All Migrations" on page 4 and "NetSpool PCL Conversion" on page 33 list an additional migration task that is required for all installations that run NetSpool. The user ID that starts NetSpool must be a z/OS UNIX® user ID.
- Chapter 5, "Summary of Interface Changes" on page 109 summarizes interface changes introduced to Infoprint Server.
- An appendix with product accessibility information has been added.

Deleted Information

The glossary has been removed and is now located in *z/OS Infoprint Server Customization*.

This book contains terminology, maintenance, and editorial changes. Technical changes or additions to the text and illustrations are indicated by a vertical line to the left of the change.

**Summary of Changes
for G544–5743-01
z/OS Version 1 Release 2**

The book contains information previously presented in G544-5743-00, which supports z/OS Version 1 Release 1.

New Information

- "Migrating from Infoprint Server Running on OS/390 V2R8–z/OS V1R1" on page 4 describes actions required by all installations that migrate from Infoprint Server and Infoprint Server Transforms running on OS/390 V2R8 or later. These migration actions are required whether or not your installation wants to enable any of the new functions introduced in z/OS V1R2.

- "Migrating from OS/390 Print Server, IP PrintWay, or NetSpool" on page 6 describes actions required by all installations that migrate from OS/390 Print Server running on OS/390 V2R5 and later, the NetSpool feature of PSF, or the IP PrintWay feature of PSF. These migration actions are required whether or not your installation wants to enable any of the new functions introduced in OS/390 V2R8 or z/OS V1R2.

- Chapter 3, "z/OS Version 1 Release 2 Overview" on page 13 summarizes the updates that have been introduced to Infoprint Server in z/OS V1R2 and describes the tasks an installation must perform to enable these enhancements.

- "Transform Enhancements" on page 66 in Chapter 4, "OS/390 Version 2 Release 8 Overview" on page 51 describes an update that was introduced to Infoprint Server Transforms. This enhancement applies to OS/390 V2R8 and all later releases.

- Chapter 5, "Summary of Interface Changes" on page 109 summarizes the interface changes introduced to Infoprint Server and Infoprint Server Transforms in z/OS V1R2.

This book contains terminology, maintenance, and editorial changes. Technical changes or additions to the text and illustrations are indicated by a vertical line to the left of the change.

About This Book

This publication summarizes enhancements introduced in the following products:

- Infoprint Server, an element of z/OS Version 1 Release 2 (5694–A01), and higher; and an element of z/OS.e Version 1 Release 3 (5655-G52), and higher
- Infoprint Server Transforms Version 1 Release 1 Modification level 1, a separate IBM licensed program product (5697–F51)

This publication describes the tasks required by all installations to migrate to z/OS V1R2. Also, for each new and changed function introduced in OS/390 V2R8 and in z/OS V1R2, this publication describes the tasks your installation must perform to use that function. For each task, it directs you to the Infoprint Server publication that describes the task.

Who Should Use This Publication

This publication is intended for anyone who needs to migrate to Infoprint Server and Infoprint Server Transforms on z/OS V1R2.

How This Publication is Organized

Within this publication, you can find information about the specific updates and considerations that apply to this release of Infoprint Server.

- Chapter 1, "Migration Overview" on page 1

  This chapter describes how to develop a plan for migrating to the current level of Infoprint Server. It describes other sources of migration information and defines terms used in this publication.

- Chapter 2, "Migration Roadmaps" on page 9

  This chapter identifies the migration paths that are supported with the current level of Infoprint Server. It also describes the additional publications that can assist you with your migration to the current level.

- Chapter 3, "z/OS Version 1 Release 2 Overview" on page 13

  This chapter describes the specific updates that were made to Infoprint Server for z/OS V1R2. For each item, this section provides an overview of the change, a description of any migration and coexistence tasks to be considered, and where you can find more detailed information in the Infoprint Server library or other element libraries.

- Chapter 4, "OS/390 Version 2 Release 8 Overview" on page 51

  This chapter describes the specific updates that were made to Infoprint Server and Infoprint Server Transforms for OS/390 V2R8. For each item, this section provides an overview of the change, a description of any migration and coexistence tasks to be considered, and where you can find more detailed information in the Infoprint Server library or other element libraries.

- Chapter 5, "Summary of Interface Changes" on page 109

  This chapter provides a summary of the changes to Infoprint Server and Infoprint Server Transforms user and programming interfaces.

- Chapter 6, "Infoprint Server Migration Program" on page 141

  This chapter describes how to use the Infoprint Server migration program.

- Appendix A, "Migration Report" on page 159

This appendix describes in detail each section of the report created by the migration program.

- Appendix B, "Migration Tables" on page 169

  This appendix contains tables that show how the migration program converts information.

- Appendix C describes accessibility features of Infoprint Server and Infoprint Server Transforms.

Where to Find More Information

This section describes where to find information related to z/OS, Infoprint Server, and Infoprint Server Transforms.

Web Sites

These Web sites contain related information:

- http://www.ibm.com/printers/

  This site contains information about printing products, including:

  – An overview of Infoprint Server, including the same printing scenarios that you can find in *z/OS Infoprint Server Introduction*.

  – Infoprint Server publications and other publications related to printing. These publications are in PDF format.

- http://www.ibm.com/printers/download.html

  This site contains downloads for Windows systems, including the Infoprint Port Monitor, the AFP Viewer plug-in, the AFP Printer Driver, and Network Printer Manager (NPM) for the Web.

- http://www.ibm.com/servers/eserver/zseries/zos/

  This site contains information about z/OS.

- http://www.ibm.com/servers/eserver/zseries/zos/bkserv/

  This site contains z/OS documentation, including:

  – All z/OS publications in both PDF and BookManager format.

  – Documentation updates that result from APARs and PTFs.

- http://ibm.com/redbooks

  This site contains IBM redbooks, including a redbook for Infoprint Server.

- http://www.ibm.com/servers/eserver/zseries/zos/unix/

  This site contains information about z/OS UNIX System Services.

Accessing Licensed Books on the Web

z/OS licensed documentation in PDF format is available on the Internet at the IBM Resource Link Web site at:

`http://www.ibm.com/servers/resourcelink/`

Licensed books are available only to customers with a z/OS license. Access to these books requires an IBM Resource Link Web userid and password, and a key code. With your z/OS order you received a memo that includes this key code.

To obtain your IBM Resource Link Web userid and password log on to:

`http://www.ibm.com/servers/resourcelink/`

To register for access to the z/OS licensed books:

1. Log on to Resource Link using your Resource Link userid and password.

2. Click on **User Profiles** located on the left-hand navigation bar.
3. Click on **Access Profile.**
4. Click on **Request Access to Licensed books.**
5. Supply your key code where requested and click on the **Submit** button.

If you supplied the correct key code you will receive confirmation that your request is being processed. After your request is processed you will receive an e-mail confirmation.

Note: You cannot access the z/OS licensed books unless you have registered for access to them and received an e-mail confirmation informing you that your request has been processed.

To access the licensed books:
1. Log on to Resource Link using your Resource Link userid and password.
2. Click on **Library**.
3. Click on **zSeries**.
4. Click on **Software**.
5. Click on **z/OS**.
6. Access the licensed book by selecting the appropriate element.

Using LookAt to look up message explanations

LookAt is an online facility that allows you to look up explanations for most of the z/OS, z/VM, and VSE messages you encounter, as well as system abends and some codes. Using LookAt to find information is faster than a conventional search because in most cases LookAt goes directly to the message explanation.

You can access LookAt from the Internet at:

`http://www.ibm.com/servers/eserver/zseries/zos/bkserv/lookat/`

or from anywhere in z/OS where you can access a TSO command line (for example, TSO prompt, ISPF, z/OS UNIX System Services running OMVS). You can also download code from the *z/OS Collection* (SK3T-4269) and the LookAt Web site so you can access LookAt from a PalmPilot (Palm VIIx suggested).

To use LookAt on the Internet to find a message explanation, go to the LookAt Web site and simply enter the message identifier (for example, `$HASP701` or `$HASP*`). You can select a specific release to narrow your search.

To use LookAt as a TSO command, you must have LookAt installed on your host system. You can obtain the LookAt code for TSO from a disk on your *z/OS Collection* (SK3T-4269) or from the LookAt Web site. To obtain the code from the LookAt Web site, do the following:
1. Go to http://www.ibm.com/servers/eserver/zseries/zos/bkserv/lookat/.
2. Click **News**.
3. Scroll to **Download LookAt Code for TSO and z/VM.**
4. Click the ftp link, which will take you to a list of operating systems. Click the appropriate operating system. Then click the appropriate release.
5. Open the **lookat.me** file and follow its detailed instructions.

After you have LookAt installed, you can access a message explanation from a TSO command line by entering: **lookat** *message-id*. LookAt will display the message explanation for the message requested.

Note: Some messages have information in more than one book. For example, IEC192I can be found in *z/OS MVS System Messages, Vol 7 (IEB-IEE)* and also in *z/OS MVS Routing and Descriptor Codes*. For such messages, LookAt displays a list of books in which the message appears. You can then select one of the books to view the message explanation.

Preventive Service Planning Information

Before installing Infoprint Server, you should review the current Preventive Service Planning (PSP) information, also called the PSP bucket. You should also periodically review the current PSP information. The PSP upgrade ID is: ZOSV1R2; the subset for Infoprint Server is: INFOPRINT.

To obtain the current PSP bucket, contact the IBM Support Center or use z/OS SoftwareXcel (IBMLink). If you obtained z/OS as part of a CBPDO, HOLDDATA and PSP information is included on the CBPDO tape; however, this information might not be current if the CBPDO tape was shipped several weeks prior to installation.

Publications

See "Bibliography" on page 185 for a list of the publications referred to in this book and publications that contain additional information about related products. For titles and order numbers of the books for *all* products that are part of z/OS, refer to *z/OS Information Roadmap*.

Infoprint Server for z/OS Implementation Redbook, SG24-6234, is available on the Web at: `http://ibm.com/redbooks`

Table 1 summarizes the publications in the Infoprint Server product library.

Table 1. Summary of Infoprint Server Publications

Publication	Form number
z/OS Infoprint Server Introduction	S544-5742
Introduces all components of Infoprint Server, including IP PrintWay™, NetSpool™, and Print Interface. It also introduces Infoprint Server Transforms. This publication contains printing scenarios that show how you can use Infoprint Server in your installation.	
z/OS Infoprint Server Migration	G544-5743
Summarizes the new function in Infoprint Server and Infoprint Server Transforms and describes the migration tasks required to implement each new function in your installation. It also describes the Infoprint Server migration program, which converts IP PrintWay, NetSpool, and Print Interface printer information to the format required by Infoprint Server for OS/390® V2R8 and higher.	

Table 1. Summary of Infoprint Server Publications (continued)

Publication	Form number
z/OS Infoprint Server Customization	S544-5744
Describes customization tasks for all components of Infoprint Server, including IP PrintWay, NetSpool, and Print Interface. It also describes customization tasks for Infoprint Server Transforms. This publication describes required environment variables, configuration files, startup procedures, how to write exit routines and filter programs, and how to use the Infoprint Server API.	
z/OS Infoprint Server Operation and Administration	S544-5745
Describes operator procedures and administrative tasks for all components of Infoprint Server, including IP PrintWay, NetSpool, and Print Interface. This publication describes how to start and stop Infoprint Server and how the operator can manage the IP PrintWay transmission queue. It describes how the administrator can create entries in the Printer Inventory using either ISPF panels or the Printer Inventory Definition Utility (PIDU) program, define NetSpool printer LUs to VTAM, and use accounting records written by IP PrintWay.	
z/OS Infoprint Server User's Guide	S544-5746
Describes how to submit print jobs from remote systems (including Windows systems), the local z/OS system, and Virtual Telecommunications Access Method (VTAM®) applications. It describes these z/OS UNIX commands: **afp2pcl**, **afp2pdf**, **afp2ps**, **cancel**, **lp**, **lpstat**, **pcl2afp**, **pdf2afp**, **ps2afp**, and **sap2afp**; the AOPPRINT JCL procedure; the AOPBATCH program; DD and OUTPUT JCL parameters supported by Infoprint Server; and how to download and install the Infoprint Port Monitor for Windows.	
z/OS Infoprint Server Messages and Diagnosis	G544-5747
Describes messages issued by all components of Infoprint Server, including IP PrintWay, NetSpool, and Print Interface. It also describes Infoprint Server Transforms messages and how to use Infoprint Server tracing facilities to diagnose and report errors.	

Understanding Syntax Notation

The following rules apply to coding illustrations throughout this publication:

- Uppercase or bold letters are to be coded as shown.
- Variable data is printed in italics. Enter specific data to replace the characters in italics.
- In general, do not enter the following symbols as part of a parameter or option:

  Vertical Bar |

  Underscore ___

  Brackets [ ]

  Braces { }

- A vertical bar between two values means that you select one of the values.
- An underscored value means that if an option is not specified, the underscored value, called the default, is used.
- Brackets around a value mean that you do not have to select the value.

- Braces around a value mean that you must select one of the values. In some statements, you must enter the braces. The text identifies when the braces are required.

Chapter 1. Migration Overview

Infoprint Server was introduced in OS/390 V2R8 and enhanced again in z/OS V1R2. It replaces the following products:

- The OS/390 Print Server element of OS/390 V2R5 – V2R7
- The IP PrintWay and NetSpool features of PSF
- The NetSpool/IP PrintWay element of OS/390 V1R3 and V2R4

Your plan for migrating to Infoprint Server should consider information from a variety of sources. These sources of information describe topics such as coexistence, service, hardware and software requirements, installation and migration procedures, and interface changes.

The following documentation, which is supplied with your product order, provides information about installing your z/OS system. In addition to specific information about Infoprint Server, this documentation contains information about all of the z/OS elements.

- *z/OS and z/OS.e Planning for Installation*

  This book describes the installation requirements for z/OS at a system and element level. It includes hardware, software, and service requirements for both the driving and target systems. It also describes any coexistence considerations and actions.

- *z/OS Program Directory*

  This document, which is provided with your z/OS product order, leads you through the specific installation steps for Infoprint Server and the other z/OS elements.

- *ServerPac Installing Your Order*

  This is the order-customized, installation book for using the ServerPac Installation method. Be sure to review "Appendix A. Product Information", which describes data sets supplied, jobs or procedures that have been completed for you, and product status. IBM might have run jobs or made updates to PARMLIB or other system control data sets. These updates could affect your migration.

Terms You Need to Know

This section describes some terms you might need to know as you use this book.

Migration   Activities that relate to the installation of a new version or release of a program to replace an earlier level. Completion of these activities ensures that the applications and resources on your system will function correctly at the new level.

Coexistence   Two or more systems at different levels (for example, software, service or operational levels) that share resources. Coexistence includes the ability of a system to respond in the following ways to a new function that was introduced on another system with which it shares resources: ignore a new function, terminate gracefully, support a new function.

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run as before, your application programmers need to know about any changes in data areas and processing requirements. This book provides an overview of the changes that might affect existing application programs.

Auditing Typically, auditors are responsible for ensuring proper access control and accountability for their installation. This book identifies any changes to security options, audit records, and report generation utilities.

Customization To meet the specific requirements of your installation, you can customize Infoprint Server functions to take advantage of new support after the product is installed. For example, you can tailor Infoprint Server through the use of environment variables, Printer Inventory entries, or exit routines. This book lists changes to Infoprint Server that might require your installation to tailor the product, either to ensure that Infoprint Server runs as before or to accommodate new functions that your installation might need.

Diagnosis The new release might introduce changes to diagnostic procedures, such as how to obtain a trace or report problems to IBM. This book identifies those changes.

General User This book provides an overview of the changes that might affect existing procedures for general users. Infoprint Server general users use Infoprint Server commands and other commands and applications to:

- Submit a print job
- Transform files from one data format to another
- Query the status of printers
- Cancel a print job

Operations New Infoprint Server releases might introduce changes to its operating characteristics, such as changed commands, new or changed messages, or in the methods of implementing new functions. This book identifies those changes for which you should provide education before running this release of the product.

Reviewing Changes to Infoprint Server Interfaces

When defining your installation's migration plan, also consider that Infoprint Server interfaces might be affected by the new or changed functions that are introduced in this release. These interfaces include:
- Application Programming Interface functions
- Configuration files
- Data sets and files
- Environment variables
- Exits
- File systems — /etc and /var directories

- Filters
- Infoprint Port Monitor for Windows
- ISPF panels
- JCL parameters of DD and OUTPUT statements
- Job attributes
- Messages
- NetSpool operator commands
- SMF type 6 record
- Startup procedures
- SYS1.MACLIB members
- SYS1.PROCLIB members
- SYS1.SAMPLIB members
- PIDU printer attributes
- TSO logon procedures
- /usr/lpp/Printsrv/samples directory
- z/OS UNIX commands

Chapter 5, "Summary of Interface Changes" on page 109 provides a summary of the changes that affect these interfaces for the release. This information is also listed in the "What This Change Affects" section that is provided for each release enhancement in Chapter 4, "OS/390 Version 2 Release 8 Overview" on page 51.

Actions Required for All Migrations

This section describes common migration activities that all installations must perform:

- If your installation currently runs Infoprint Server on OS/390 V2R8 - V2R10 or z/OS V1R1, see "Migrating from Infoprint Server Running on OS/390 V2R8–z/OS V1R1".
- If your installation currently runs the Print Server on OS/390 V2R5 - V2R7; the NetSpool or IP PrintWay feature of PSF; or the NetSpool/IP PrintWay element of OS/390 V1R3 or V2R4, see "Migrating from OS/390 Print Server, IP PrintWay, or NetSpool" on page 6.

Migrating from Infoprint Server Running on OS/390 V2R8–z/OS V1R1

If you currently run Infoprint Server on OS/390 V2R8 - V2R10 or z/OS V1R1, you must perform the migration tasks described in this section. Table 2 on page 5 lists the *required* migration tasks and refers to the publication that describes each task.

Also, see Chapter 3, "z/OS Version 1 Release 2 Overview" on page 13 for a summary of the enhancements introduced in Infoprint Server for z/OS V1R2 and the tasks that apply if you want to enable any of these enhancements in your installation.

Table 2. Summary of Required Migration Tasks for Migrating from Infoprint Server on OS/390 V2R8 and Later

Migration Task	Reference Information
Save the directory that contains the Infoprint Server Printer Inventory files. The default directory is **/var/Printsrv**; however, your installation might have changed the directory name in the **base-directory** statement in the Infoprint Server configuration file, **aopd.conf**. The format of the Printer Inventory has *not* changed in z/OS V1R2; therefore, you can continue to use the same Printer Inventory that you use in OS/390 V2R8 and later releases.	*z/OS Infoprint Server Customization*
If your installation modified the Infoprint Server configuration file, save the file. Its default location is **/etc/Printsrv/aopd.conf**; however, your installation might have specified a different location in environment variable AOPCONF.	*z/OS Infoprint Server Customization*
Specify environment variables in the **aopstart** EXEC if any of the following conditions apply: • Infoprint Server executable files, message files, and configuration files are not in the default locations • Infoprint Server Transforms configuration files are not in the default locations • LE and C^{++} run-time libraries are not in SYS1.LNKLST • You have defined multiple TCP/IP stacks • You run the Infoprint Server SAP Output Management System (OMS) • You run the Print Interface IPP server and Java 1.3 libraries are not in the default directories • You want to change the default trace directory	*z/OS Infoprint Server Customization*
If you use the AOPSTART procedure, specify the AOPTRACEON and LANG environment variables in the STDENV data set in the new procedure if you want to trace Infoprint Server or view Infoprint Server messages in Japanese.	*z/OS Infoprint Server Customization*
Perform the following tasks if you currently run Print Interface:	
Save any data stream filters your installation has written. The filters do not need to be recompiled.	*z/OS Infoprint Server Customization*
Perform the following tasks if you currently run Infoprint Server Transforms:	
If your installation modified the default transform configuration file, save the file. Its default location is **/etc/Printsrv/aopxfd.conf**; however, your installation might have specified a different location in environment variable AOPXFD_CONF.	*z/OS Infoprint Server Customization*
If your installation modified the configuration files for the SAP to AFP transform, save the directory that contains the files. The default directory is **/usr/lpp/Printsrv/sap2afp**; however, if your installation modified these files, the modified files are in the directory named in environment variable AOP_SAP2AFP_RESOURCES.	*z/OS Infoprint Server Customization*
If your installation modified the **UserInit** or **preload.ps** configuration file for the PostScript to AFP transform, or added fonts for the transform, save the directory that contains the modified files and fonts. This directory is named in environment variable AOP_RESOURCE_PATH, which is specified in the **ps2afp** transform entry in the transform configuration file, **aopxfd.conf**.	*z/OS Infoprint Server Customization*
If your installation modified the multibyte conversion tables for the SAP to AFP transform, save the directory that contains the files, **/usr/lib/nls/locale/uconvTable**.	*z/OS Infoprint Server Customization*

Table 2. Summary of Required Migration Tasks for Migrating from Infoprint Server on OS/390 V2R8 and Later (continued)

Migration Task	Reference Information
If your installation modified the font-mapping table, AOXFONTS, used by the AFP to PCL, AFP to PDF, and AFP to PostScript transforms, apply usermods to install the modified font-mapping table in each AFP transform.	*z/OS Infoprint Server Customization*
If your installation scaled 240-pel fonts to 300-pel fonts for use with the AFP to PCL, AFP to PDF, and AFP PostScript transforms, save the data set that contains the 300–pel fonts.	*z/OS Infoprint Server Customization*
Perform the following task if you currently run NetSpool:	
Ensure that the user ID that starts NetSpool is a z/OS UNIX user ID. The user ID must have an OMVS segment and a home directory.	*z/OS Infoprint Server Customization*
If your installation does not add the LE and C++ run-time libraries to the system LNKLST, add the CEE.SCEERUN and CBC.SCLBDLL data sets to the NetSpool startup procedures, and restart NetSpool.	*z/OS Infoprint Server Customization*
Save any NetSpool exits your installation has written. The exits do not need to be recompiled unless you want to use new functions.	*z/OS Infoprint Server Customization*
Perform the following task if you currently run IP PrintWay:	
Save any IP PrintWay exits your installation has written. The exits do not need to be recompiled unless you want to use new functions.	*z/OS Infoprint Server Customization*
Perform the following task if you use the AFP Printer Driver or AFP Viewer:	
Download the AFP Driver and AFP Viewer from the IBM Printing Systems Division (PSD) Web site instead of from a z/OS directory. The IBM PSD Web site address for downloads is: `http://www.ibm.com/printers/dowload.html`	*z/OS Infoprint Server User's Guide*
Perform the following tasks if you currently run the Infoprint Server IPP Server:	
If your installation currently runs Java 1.1.8, install Java 1.3. If you did not install Java 1.3 libraries in the default directories, specify the Java directory in the JAVA_HOME environment variable in the new **aopstart** EXEC. Run the AOPJAUTH program to authorize the Java libraries.	*z/OS Infoprint Server Customization*
Your installation runs the Infoprint Server IPP Server if the **start-daemons=ippd** attribute is specified in the Infoprint Server configuration file. Its default location is **/etc/Printsrv/aopd.conf**; however, your installation might have specified a different location in environment variable AOPCONF.	

Migrating from OS/390 Print Server, IP PrintWay, or NetSpool

If you currently run the (1) OS/390 Print Server element of OS/390 V2R5 - V2R7, (2) NetSpool or IP PrintWay feature of PSF, or (3) NetSpool/IP PrintWay element of OS/390 V1R3 or V2R4, you *must* perform the migration tasks described in this section. Table 3 on page 7 summarizes the *required* migration tasks and refers to the publication or chapter that describes each task.

Also, see Chapter 3, "z/OS Version 1 Release 2 Overview" on page 13 and Chapter 4, "OS/390 Version 2 Release 8 Overview" on page 51 for a summary of the enhancements introduced in Infoprint Server in OS/390 V2R8 and z/OS V1R2 and the tasks that apply if you want to enable any of these enhancements in your installation.

Table 3. Summary of Required Migration Tasks for Migrating from Print Server, NetSpool, or IP PrintWay

Migration Task	Reference Information
Customize the Printer Inventory Manager component of Infoprint Server.	*z/OS Infoprint Server Customization*

If your installation currently runs Print Interface, you have already customized the Printer Inventory Manager. Therefore, you need to perform only the following subset of customization tasks:
 	
 • Save your Print Interface configuration file in the same directory; its default location is **/etc/Printsrv/aopd.conf**.
 	
 • Change the NLSPATH environment variable in **/etc/profile** to specify **/usr/lpp/Printsrv/En_US/%N** or **/usr/lpp/Printsrv/%L/%N**. (Note the change to an uppercase E in En_US.)
 	
 • Library AOP.SAOPEXEC replaces ANF.SANFEXEC. Concatenate library AOP.SAOPEXEC to the SYSEXEC statement in your TSO logon procedures, and remove the ANF.SANFEXEC library.
 	
 • Specify environment variables in the **aopstart** EXEC if any of the following conditions apply:
  – Infoprint Server executable files, message files, and configuration files are not in the default locations
  – Infoprint Server Transforms configuration files are not in the default locations
  – LE and C^{++} run-time libraries are not in SYS1.LNKLST
  – You have defined multiple TCP/IP stacks
  – You run the Infoprint Server SAP Output Management System (OMS)
  – You run the Print Interface IPP server and Java 1.3 libraries are not in the default directories
  – You want to change the default trace directory	

Start the Printer Inventory Manager daemon (**aopd**). Start this daemon *before* creating any objects in the Printer Inventory and *before* you start NetSpool or IP PrintWay.	*z/OS Infoprint Server Operation and Administration*
Run the Infoprint Server migration program and the PIDU program to convert existing printer information for IP PrintWay, NetSpool, and Print Interface to the format required by the new Infoprint Server Printer Inventory introduced in OS/390 V2R8.	Chapter 6, "Infoprint Server Migration Program" on page 141
Perform the following tasks if you currently run IP PrintWay:	
Ensure that the user ID that starts IP PrintWay is a z/OS UNIX user ID. The user ID must have an OMVS segment and a home directory.	*z/OS Infoprint Server Customization*
Delete your existing IP PrintWay transmission queue data set; allocate and initialize a new transmission-queue data set, ANF.QUEUE, using new allocation parameters.	*z/OS Infoprint Server Customization*
Change your IP PrintWay startup procedure to specify the INV parameter (with the name of the Printer Inventory) and to remove unused parameters. Restart IP PrintWay FSAs and FSS using the new startup procedure.	*z/OS Infoprint Server Customization*
Remove V2R5-V2R7 IP PrintWay libraries from your TSO logon procedures; IP PrintWay libraries have high level qualifier ANF.	*z/OS Infoprint Server Customization*
Recompile any IP PrintWay exits your installation has written.	*z/OS Infoprint Server Customization*
Perform the following tasks if you currently run NetSpool:	

Migration Overview

Table 3. Summary of Required Migration Tasks for Migrating from Print Server, NetSpool, or IP PrintWay (continued)

Migration Task	Reference Information
Ensure that the user ID that starts NetSpool is a z/OS UNIX user ID. The user ID must have an OMVS segment and a home directory.	*z/OS Infoprint Server Customization*
Change your NetSpool startup procedure to specify the INV parameter (with the name of the Printer Inventory) and to remove the WTOR parameter. Restart the NetSpool program using the new startup procedure.	*z/OS Infoprint Server Customization*
If your installation does not add the LE and C^{++} run-time libraries to the system LNKLST, add the CEE.SCEERUN and CBC.SCLBDLL data sets to the NetSpool startup procedures, and restart NetSpool.	*z/OS Infoprint Server Customization*
Link-edit any NetSpool exits your installation has written into an APF-authorized library.	*z/OS Infoprint Server Customization*

Chapter 2. Migration Roadmaps

This section describes the migration paths that are supported by the current release of Infoprint Server and Infoprint Server Transforms. Select the roadmap that applies to your migration path and review the changes for the associated releases.

OS/390 V2R8 to z/OS V1R2 Summary

This section summarizes the updates that have been introduced to Infoprint Server in z/OS Version 1 Release 2 (V1R2). Use the table in this section if you are migrating from Infoprint Server running on an earlier release of OS/390 or z/OS.

Table 4. Changes Introduced to Infoprint Server in z/OS V1R2

For Information About:	See Page:
AFP Driver and AFP Viewer Not Part of Infoprint Server	14
AOPSTART and AOPSTOP Procedure Enhancements	15
IP PrintWay Copy Support for LAN Printers	17
IP PrintWay E-mail Support	18
IP PrintWay Exit Enhancement	22
IP PrintWay Enhancements for Printing to VTAM Printers	23
IP PrintWay Query Printer Status	25
IP PrintWay Resubmit for Filtering Enhancements	26
IP PrintWay TCP/IP Connection Timeout Enhancement	29
NetSpool Exit Enhancements	31
NetSpool PCL Conversion	33
Print Interface >255 Copies Support	36
Print Interface Infoprint Port Monitor for Windows Enhancements	37
Print Interface IPP Server Java Support	39
Print Interface Remote Transform Support for IBM Infoprint Color 130 Plus Printer	40
Print Interface Subsystem for Batch Applications	42
PSF for OS/390 FSA Definition Enhancements	45
Sample Customization Files	47
Secure Environment	48

OS/390 Print Server, NetSpool, or IP PrintWay to z/OS V1R2 Summary

This section summarizes the updates that have been introduced to Infoprint Server and Infoprint Server Transforms in OS/390 Version 2 Release 8 (V2R8) and in z/OS Version 1 Release 2 (V1R2). Use the tables in this section if you are migrating from OS/390 Print Server. Use the tables that describe updates to the NetSpool or IP PrintWay components of Infoprint Server if you are migrating from any of the following previous levels of NetSpool or IP PrintWay:

- NetSpool feature of PSF running on any release of MVS, OS/390, or z/OS
- IP PrintWay feature of PSF running on any release of MVS, OS/390, or z/OS
- NetSpool/IP PrintWay running on OS/390 V1R3 or OS/390 V2R4

Migration Roadmaps

Table 5 summarizes the changes that were introduced to the Print Interface component of Infoprint Server in OS/390 V2R8 and z/OS V1R2. If your installation currently runs a previous level of Print Interface you should review the information in the detailed section for each item in the table.

Table 5. Changes Introduced to Print Interface component of Infoprint Server in OS/390 V2R8 and Later

For Information About:	See Page:
Changes Introduced in z/OS V1R2	
Print Interface >255 Copies Support	36
Print Interface Infoprint Port Monitor for Windows Enhancements	37
Print Interface IPP Server Java Support	39
Print Interface Remote Transform Support for IBM Infoprint Color 130 Plus Printer	40
Print Interface Subsystem for Batch Applications	42
Changes Introduced in OS/390 V2R8	
Printer Inventory	53
Print Interface Remote Transforms	68
Print Interface IPP Server	70
Print Interface Dynamic Allocation Enhancements	71
Print Interface AOPPRINT JCL Procedure	72
Print Interface lp Command Enhancements	73
Print Interface Job Status Enhancements	75
Print Interface SMB Protocol Support	76
Infoprint Port Monitor for Windows Enhancements	78
Print Interface Filter Enhancements	79
Print Interface API	80
Print Interface SAP Output Management System	81
Print Interface LPD Compatibility Filter	83

Table 6 on page 11 summarizes the changes that were introduced to the NetSpool component of Infoprint Server in z/OS V1R2 and in OS/390 V2R8. If your installation currently runs a previous level of NetSpool, you should review the information in the detailed section for each item in the table.

Table 6. Changes Introduced to NetSpool in OS/390 Version 2 Release 8 and Later

For Information About:	See Page:
Changes Introduced in z/OS V1R2	
NetSpool Exit Enhancements	31
NetSpool PCL Conversion	33
Changes Introduced in OS/390 V2R8	
Printer Inventory	53
NetSpool Operator Command Enhancements	85
NetSpool Dynamic Allocation Enhancement	87

Table 7 summarizes the changes that were introduced to the IP PrintWay
component of Infoprint Server in z/OS V1R2 and in OS/390 V2R8. If your
installation currently runs a previous level of IP PrintWay, you should review the
information in the detailed section for each item in the table.

Table 7. Changes Introduced to IP PrintWay in OS/390 Version 2 Release 8 and Later

For Information About:	See Page:
Changes Introduced in z/OS V1R2	
IP PrintWay Copy Support for LAN Printers	17
IP PrintWay E-mail Support	18
IP PrintWay Exit Enhancement	22
IP PrintWay Enhancements for Printing to VTAM Printers	23
IP PrintWay Query Printer Status	25
IP PrintWay Resubmit for Filtering Enhancements	26
IP PrintWay TCP/IP Connection Timeout Enhancement	29
Changes Introduced in OS/390 V2R8	
Printer Inventory	53
IP PrintWay Startup Enhancements	88
IP PrintWay IPP Client	90
IP PrintWay Printer Selection with FSSDATA JCL Parameter	92
IP PrintWay Extended Routing Criteria	94
IP PrintWay Code Page Conversion	96
IP PrintWay Printer Instruction Enhancements	98
IP PrintWay Coordination with Print Interface and NetSpool	99
IP PrintWay Restrict Ports	101
IP PrintWay Transform Function	102
IP PrintWay VTAM Printer Support	104

Table 8 on page 12 summarizes the enhancements that were introduced to Infoprint
Server and Infoprint Server Transforms in z/OS V1R2 and OS/390 V2R8 that are
not specific to the Print Interface, NetSpool, or IP PrintWay components. If you
currently run Print Interface, NetSpool, or IP PrintWay, you should review the
information in the detailed section for each item.

Migration Roadmaps

Table 8. Additional Changes Introduced to Infoprint Server and Infoprint Server Transforms in OS/390 Version 2 Release 8 and Later

For Information About:	See Page:
Changes Introduced in z/OS V1R2	
AFP Driver and AFP Viewer Not Part of Infoprint Server	14
AOPSTART and AOPSTOP Procedure Enhancements	15
PSF for OS/390 FSA Definition Enhancements	45
Sample Customization Files	47
Secure Environment	48
Changes Introduced in OS/390 V2R8	
Transforms	60
AFP to PCL, AFP to PDF, and AFP to PostScript Transforms	62
Kanji AFP Print Feature	65
Transform Enhancements	66
SNMP Subagent	106
PSF for OS/390 Startup Enhancements	108

Summary of Publication Changes in OS/390 V2R8

The Infoprint Server library was reorganized in OS/390 V2R8. In previous releases, a separate publication for each component (Print Interface, IP PrintWay, and NetSpool) described the customization, administrative, operational, and diagnostic tasks for that component. Starting with OS/390 V2R8, the information for all components is centralized in a common library of Infoprint Server publications. For example, customization information previously in the "NetSpool Guide", the "IP PrintWay Guide", and the "Print Interface Customization Guide" can now be found in *z/OS Infoprint Server Customization*.

In addition, the Infoprint Server ISPF help panels contain more integrated product information. The administrator uses the Infoprint Server ISPF panels to create and manage entries in the Printer Inventory. Field-specific information (such as allowed values, defaults, and field interactions) previously contained in the individual component publications can now be found in the online help for the Infoprint Server panels and fields.

"Where to Find More Information" on page xiv describes the contents of the publications in the Infoprint Server library.

Chapter 3. z/OS Version 1 Release 2 Overview

The following sections describe the new and changed functions that were introduced to Infoprint Server in z/OS Version 1 Release 2 (V1R2). The information about each item includes:
- Description
- Summary of the Infoprint Server tasks or interfaces that may be affected
- Coexistence considerations, if any, that are associated with the item
- Migration tasks, if any, that are associated with the item
- References to other publications that contain additional detailed information

Note: Some migration tasks are required whether or not your installation plans to use a new or changed function. See "Actions Required for All Migrations" on page 4 for the migration tasks that are required by *all* installations, even if your installation does not plan to implement any of the new functions.

Release Summary

Table 9 summarizes the updates that have been made to Infoprint Server in z/OS V1R2. For more information, see the detailed section for each item.

Table 9. Summary of Infoprint Server Enhancements for z/OS Version 1 Release 2

For Information About:	See Page:
AFP Driver and AFP Viewer Not Part of Infoprint Server	14
AOPSTART and AOPSTOP Procedure Enhancements	15
IP PrintWay Copy Support for LAN Printers	17
IP PrintWay E-mail Support	18
IP PrintWay Exit Enhancement	22
IP PrintWay Enhancements for Printing to VTAM Printers	23
IP PrintWay Query Printer Status	25
IP PrintWay Resubmit for Filtering Enhancements	26
IP PrintWay TCP/IP Connection Timeout Enhancement	29
NetSpool Exit Enhancements	31
NetSpool PCL Conversion	33
Print Interface >255 Copies Support	36
Print Interface Infoprint Port Monitor for Windows Enhancements	37
Print Interface IPP Server Java Support	39
Print Interface Remote Transform Support for IBM Infoprint Color 130 Plus Printer	40
Print Interface Subsystem for Batch Applications	42
PSF for OS/390 FSA Definition Enhancements	45
Sample Customization Files	47
Secure Environment	48

AFP Driver and AFP Viewer Not Part of Infoprint Server

Description

The AFP Driver for Windows and the AFP Viewer plug-in for Windows are no longer shipped as part of Infoprint Server. These products are still available at no charge from the IBM Printing Systems Division Web site at:

`http://www.ibm.com/printers/download.html`

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	None.
Application Development	None.
Auditing	None.
Customization	The Windows administrator must download the AFP Driver from the Web when defining a shared Windows printer.
Diagnosis	None.
General User	The Windows user must download the AFP Viewer and AFP Driver from the Web.
Operations	None.
Interfaces	None.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only to specified operating environments or to situations where there is more than one way to set up or enable the function. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
Download the AFP Driver and AFP Viewer from the Web instead of from z/OS.	Required	*z/OS Infoprint Server User's Guide*

For More Information

For more detailed information about this support, refer to *z/OS Infoprint Server User's Guide*.

AOPSTART and AOPSTOP Procedure Enhancements

Description

Infoprint Server has enhanced the AOPSTART and AOPSTOP procedures, which you can use to start and stop Infoprint Server daemons:

- The AOPSTART procedure now lets you specify the AOPTRACEON and LANG environment variables in a file referred to by the STDENV DD statement in the AOPSTART procedure. The AOPSTART procedure no longer uses any environment variables that are set in the **/etc/profile** file.

- The AOPSTOP procedure now lets you specify options when you use the procedure. These options let you stop selected daemons and control when the daemons are stopped. In the previous release, you had to edit the AOPSTOP procedure or use the z/OS UNIX **aopstop** command in order to stop selected daemons.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	None.
Application Development	None.
Auditing	None.
Customization	The system programmer now must specify the LANG variable in the STDENV data set to view Japanese messages.
Diagnosis	The diagnostician now must specify the AOPTRACEON variable in the STDENV data set.
General User	None.
Operations	The operator can specify options on the AOPSTOP procedure to stop selected daemons.
Interfaces	See Table 32 on page 135.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that use this function. **Optional** tasks apply only to specified operating environments or to situations where there is more than one way to set up or enable the function. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
Specify the AOPTRACEON and LANG environment variables in the STDENV data set in the new AOPSTART procedure if you want to trace Infoprint Server or view Infoprint Server messages in Japanese.	Optional	*z/OS Infoprint Server Customization*, *z/OS Infoprint Server Messages and Diagnosis*
Specify AOPSTOP procedure options if you want to stop individual Infoprint Server daemons.	Optional	*z/OS Infoprint Server Operation and Administration*

AOPSTART and AOPSTOP Enhancements

For More Information

For more detailed information about this support, refer to the following publications:

- *z/OS Infoprint Server Customization*
- *z/OS Infoprint Server Messages and Diagnosis*

IP PrintWay Copy Support for LAN Printers

Description

The IP PrintWay component of Infoprint Server now can print more than one copy of a document on any remote printer or print server that either contains a line printer daemon (LPD) or supports the direct sockets printing protocol. IP PrintWay now transmits a data set multiple times to the printer, while ensuring that all copies of the data set print together. In the previous release, IP PrintWay provided copies support only for a small subset of printers whose LPDs support printing the same data set multiple times. Also, the administrator can now limit the number of copies that are allowed to print on each printer.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	The administrator can control how IP PrintWay prints copies.
Application Development	None.
Auditing	None.
Customization	None.
Diagnosis	None.
General User	None.
Operations	None.
Interfaces	See Table 20 on page 124 and Table 24 on page 130.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only to specified operating environments or to situations where there is more than one way to set up or enable the function. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
By default, this new copy support is enabled. You can disable this support to improve performance for a printer whose LPD supports printing multiple copies of the same data set. To do this, select the **Optimize copies** field in the printer definition.	Optional	*z/OS Infoprint Server Operation and Administration*
If you want to limit the number of copies, specify the maximum number of copies in the **Maximum copies** field in the printer definition.	Optional	*z/OS Infoprint Server Operation and Administration*

For More Information

For more detailed information about this support, refer to *z/OS Infoprint Server Operation and Administration*.

IP PrintWay E-mail Support

Description

The IP PrintWay component of Infoprint Server now lets you send output from the JES spool to one or more e-mail addresses. Previously, IP PrintWay could transmit output only to printers and print servers. This support lets you easily distribute documents over the Internet and lets e-mail recipients view the output and print it only when necessary.

Some features of the e-mail support are:
- IP PrintWay uses the z/OS UNIX sendmail function of z/OS Communications Server.
- IP PrintWay sends each document as an e-mail attachment.
- Data can be in any format, including PDF, PostScript, AFP, and text format.
- You can transform print data to another format that is suitable for viewing on a workstation, as follows:
  - Transform traditional line data and VTAM application data (for example, CICS and IMS data) to text format.
  - Transform traditional line data, VTAM application data, and AFP data to PDF or PostScript format.
  - Transform PCL data, SAP OTF data, PostScript Data, and VTAM application data to AFP format.
- When you print VTAM application data, you can send output to an e-mail address list and print it at the same time.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	Create printer definitions in the Printer Inventory for each e-mail address or address list. Create printer pool definitions to print and e-mail VTAM application data. Handle bounced e-mails and replies. Create sendmail aliases.
Application Development	None.
Auditing	IP PrintWay writes an SMF type-6 record for each e-mail it sends.
Customization	Customize sendmail and other components of z/OS Communications Server that sendmail requires. Customize any transforms you want to use, such as the AFP to PDF transform. If you transform data, specify no blank truncation for JES output classes. If sendmail and Infoprint Server files are not in default locations, specify environment variables in the IP PrintWay startup procedure.
Diagnosis	Diagnose possible setup problems with sendmail.
General User	Specify the e-mail title and attachment name in JCL parameters and job attributes if the default values are not suitable. To send AFP files that use external AFP resources, use the IBM ACIF program to create a file with AFP resources. To view e-mail attachments that are not in text format, download and customize a viewer.
Operations	Start sendmail.
Interfaces	See "Environment Variables" on page 113, "Infoprint Server ISPF Panels" on page 124, and "PIDU Printer Attributes" on page 130.

Dependencies

Apply Infoprint Server PTFs UW85327 and UW85325 to obtain this enhancement in z/OS V1R2 and later releases.

To transform data to PDF, PostScript, or AFP format, one of the following features of Infoprint Server Transforms (5697–F51) is required:

- Transforms to AFP feature to transform PCL, PostScript, and PDF data to AFP format. This feature is available at no extra charge to Infoprint Server customers.
- AFP to PDF feature to transform line and AFP data to PDF format. This feature is priced separately.
- AFP to PostScript feature to transform line and AFP data to PostScript format. This feature is priced separately.

If you use the AFP to PDF transform, outline fonts are recommended.

The IBM ACIF program, an optional feature of PSF for OS/390 (5655–B17), is required to capture external AFP resources so that they can be included in AFP files sent as e-mail attachments.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only to specified operating environments or to situations where there is more than one way to set up or enable the function. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
Customize z/OS UNIX sendmail and other components of z/OS Communications Server required by sendmail.	Required	*z/OS Infoprint Server Customization*, *Sendmail* by O'Reilly & Associates, Inc.
Customize data stream transforms, such as the AFP to PDF transform, if you want the e-mail attachment to be in another format, such as in PDF format. In the configuration file entry for the AFP to PDF transform or in the printer definition, specify AFP resource libraries and a default font. In the transform configuration file, request that the transform map raster fonts to outline fonts because outline fonts provide superior viewing.	Optional	*z/OS Infoprint Server Customization*
In the JES2 OUTCLASS statements or JES3 SYSOUT statements, specify no blank truncation for all JES output classes specified in the printer definitions.	Required	*z/OS Infoprint Server Customization*
Specify environment variables in the IP PrintWay startup procedure if you did not install z/OS UNIX sendmail and Infoprint Server files in the default directories. Restart IP PrintWay to pick up the changes.	Optional	*z/OS Infoprint Server Customization*

IP PrintWay E-mail

Task	Condition	Reference Information
Write or modify IP PrintWay exits if you want to dynamically modify e-mail processing. The Routing, Begin Data Set, End Data Set, and Record exits can detect that the e-mail protocol is selected. You might want to write or modify these exits for the e-mail protocol: • Routing exit: You can modify e-mail addresses and transmission options. • Begin Data Set and End Data Set exits: You can suppress any separator pages and printer instructions that these exits add. You do not need to recompile existing exits.	Optional	*z/OS Infoprint Server Customization*
Create a printer definition in the Printer Inventory for each e-mail address or address list. In the printer definition, select the e-mail protocol, specify the e-mail addresses of the recipients, and specify other fields used for the e-mail protocol.	Required	*z/OS Infoprint Server Operation and Administration*
In the printer definition, specify a data-stream transform and the fields used for the transform. Suggested transforms are: • AFP to PDF transform • PCL to AFP transform	Optional	*z/OS Infoprint Server Operation and Administration*
Create a printer pool definition in the Printer Inventory if you want to e-mail and print VTAM application data (such as CICS and IMS data) at the same time.	Optional	*z/OS Infoprint Server Operation and Administration*
Create a z/OS UNIX sendmail alias name for any e-mail address list that is greater than 256 characters. Specify the alias name in the printer definition.	Optional	*z/OS Infoprint Server Operation and Administration*, *Sendmail* by O'Reilly & Associates, Inc.
Start sendmail.	Required	*z/OS Infoprint Server Operation and Administration*
Handle bounced e-mails and replies.	Required	*z/OS Infoprint Server Operation and Administration*, *Sendmail* by O'Reilly & Associates, Inc.
Specify the subject of the e-mail in the TITLE JCL parameter and the e-mail attachment name in the DSNAME JCL parameter if the default values are not suitable.	Optional	*z/OS Infoprint Server User's Guide*
Specify the subject of the e-mail in the Infoprint Server **title-text** job attribute if the default value is not suitable.	Optional	*z/OS Infoprint Server User's Guide*
Use the IBM ACIF program to create a separate file with AFP resources if you want to e-mail an AFP file that uses external AFP resources. ACIF creates a separate AFP resource file that you must concatenate to your document when you submit the print job. ACIF is not required if you use the AFP to PDF transform to transform line and AFP files to PDF format.	Optional	*z/OS Infoprint Server User's Guide*

Task	Condition	Reference Information
Download a viewer to your workstation to view e-mail attachments that are not in text format. Suggested viewers are: • Adobe Acrobat Reader for PDF files • IBM APF Viewer for Windows for AFP files • Ghostview for PostScript files We recommend using the latest viewer available. Additional customization might be required for the Adobe Acrobat Reader.	Optional	*z/OS Infoprint Server User's Guide*

For More Information

For more detailed information about this support, refer to the following publications:

- *z/OS Infoprint Server Customization*
- *z/OS Infoprint Server Operation and Administration*
- *z/OS Infoprint Server User's Guide*
- *Sendmail* by O'Reilly & Associates, Inc. (ISBN 1–56592–222–0)

IP PrintWay Exit Enhancement

Description

The IP PrintWay component of Infoprint Server has enhanced how exits work with the **Document header** and **Document trailer** fields in the printer definition:

- Printer instructions specified in the **Document header** field no longer apply to data added by the IP PrintWay Begin Data Set exit.
- Printer instructions specified in the **Document trailer** field now apply to data added by the IP PrintWay End Data Set exit.

For example, if (1) the **Document header** field contains printer instructions for landscape printing, (2) the **Document trailer** field contains printer instructions to reset the printer to portrait orientation, and (3) the IP PrintWay Begin Data Set exit and End Data Set exit add a separator page, now the separator pages will print in the portrait orientation. If you want the separator pages to print in the landscape orientation, you must add printer instructions for landscape printing in your Begin Data Set exit and End Data Set exit.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	None.
Application Development	None.
Auditing	None.
Customization	The system programmer might need to modify IP PrintWay exits.
Diagnosis	None.
General User	None.
Operations	None.
Interfaces	See Table 15 on page 113.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only to specified operating environments or to situations where there is more than one way to set up or enable the function. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
Review your IP PrintWay Begin Data Set and End Data Set exits to determine if this change affects your exits. Review exits only if you specify the **Document header** or **Document trailer** fields in your printer definitions.	Optional	*z/OS Infoprint Server Customization*

For More Information

For more detailed information about this support, refer to *z/OS Infoprint Server Customization*.

IP PrintWay Enhancements for Printing to VTAM Printers

Description

IP PrintWay now provides enhanced support for printing to VTAM-controlled printers:

- The administrator can request that IP PrintWay transmit output data sets from the JES spool to VTAM-controlled printers without converting the data to SNA Character String (SCS) or Data Stream Compatible/Data Stream Extended (DSC/DSE) format. This support means that you can now print data that is already in the format required by your VTAM-controlled printers. For example, you can print PCL data to VTAM-controlled printers that accept PCL data.

  Optionally, IP PrintWay can transmit the unchanged data to the VTAM-controlled printer as transparent data. This support lets you transmit data through an SNA gateway that requires that data be preceded by transparent data controls. Typically, the SNA gateway removes the transparent data controls before transmitting the data to the printer. For each printer, the administrator can specify the transparent data character that the SNA gateway expects in the transparent data controls.

- The administrator can change the end-of-line controls that IP PrintWay adds to the end of each line. This support is available only when IP PrintWay converts line data to SCS or DSC/DSE format.

- The administrator can request that IP PrintWay delete form-feed controls that result in blank pages at the beginning and end of documents. This support is available when IP PrintWay converts line data to SCS or DSC/DSE format.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	Create an IP PrintWay printer definition in the Printer Inventory for the VTAM protocol. Select options for printing binary data; specify a line termination value; select the delete form feed option.
Application Development	None.
Auditing	None.
Customization	None.
Diagnosis	
General User	None.
Operations	None.
Interfaces	See "Infoprint Server ISPF Panels" on page 124 and "PIDU Printer Attributes" on page 130.

Dependencies

Apply the following PTFs to obtain this enhancement in z/OS V1R2 and later releases:

- To print data unchanged to VTAM-controlled printers:
  - Infoprint Server PTFs UW82899 and UW82940
  - Infoprint Server Transforms PTF UW82927
- To change the end-of-line control:

IP PrintWay Enhancements for Printing to VTAM Printers

– Infoprint Server PTFs UW82899 and UW82940
- To delete form-feed controls:
  – Infoprint Server PTF UW85178
  – Infoprint Server Transforms PTF UW85179

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only to specified operating environments or to situations where there is more than one way to set up or enable the function. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
Create a printer definition for each VTAM-controlled printer. In the printer definition, select the following options: • **None** option in the **Formatting** field on the IP PrintWay Options panel. • **Send as transparent data** field on the VTAM Protocol panel. Also, specify the transparent data control character in the **Transparent data char** field; the default value is X'35'.	Required	*z/OS Infoprint Server Operation and Administration*
In the printer definition for a VTAM-controlled printer, specify the line-termination value in the **Line termination** field on the IP PrintWay Options panel; the default value is X'0D15'.	Required	*z/OS Infoprint Server Operation and Administration*
In the printer definition for a VTAM-controlled printer, select the type of form feeds to delete in the **Form feed** field on the IP PrintWay Options panel. You can delete form feeds at the beginning and end of data sets.	Required	*z/OS Infoprint Server Operation and Administration*

For More Information

For more detailed information about this support, refer to *z/OS Infoprint Server Operation and Administration*.

IP PrintWay Query Printer Status

Description

The IP PrintWay component of Infoprint Server now lets the operator query the status of the printer from the Infoprint Server ISPF panels. The operator will find this function useful when transmission of a data set to the printer is unsuccessful. This function is available only when IP PrintWay uses the LPR to LPD transmission protocol to transmit a data set to the printer.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	None.
Application Development	None.
Auditing	None.
Customization	None.
Diagnosis	None.
General User	None.
Operations	The operator can query the status of a printer from Infoprint Server ISPF panels.
Interfaces	See Table 20 on page 124.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only to specified operating environments or to situations where there is more than one way to set up or enable the function. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
Use the Infoprint Server ISPF panels to view the IP PrintWay transmission queue, and enter **S** or **L** in the Action column in front of a queue entry.	Required	*z/OS Infoprint Server Operation and Administration*

For More Information

For more detailed information about this support, refer to *z/OS Infoprint Server Operation and Administration*.

IP PrintWay Resubmit for Filtering Enhancements

Description

When you use the IP PrintWay resubmit for filtering function to transform data, Print Interface allocates a second sysout data set on the JES spool for each original sysout data set; the second sysout data set contains the transformed data.

Before these enhancements to the resubmit for filtering function:

- The job ID and job name of the second sysout data set on the JES spool were not the same as the job ID and job name of the original sysout data set. Therefore, the operator could not find the second sysout data set on the JES spool.
- The ID of the user who started the Infoprint Server LPD printed as the owner on separator pages, was recorded as the owner in the SMF type 6 record for the second sysout data set, and was passed as input to IP PrintWay exit routines.

With these enhancements to the resubmit for filtering function:

- The job ID and job name of the second sysout data set on the JES spool are the same as the job ID and job name of the original sysout data set.
- The ID of the job submitter prints on separator pages, is recorded as the owner in the SMF type 6 records for both the first and second sysout data sets, and is passed as input to IP PrintWay exit routines.

The following table summarizes the contents of SDSF fields for the second sysout data set on the JES spool. For comparison, the table also summarizes the contents before this enhancement.

Data Set Field on JES Spool[1]	Contents	Contents Before This Enhancement
Job ID	Job ID assigned by z/OS to the original sysout data set[2]	Job ID assigned by Infoprint Server to the second sysout data set
Job name	Job name of the original sysout data set	User ID of the job submitter
Owner	User ID of the user who started the Infoprint Server LPD	User ID of the user who started the Infoprint Server LPD

1. This is the SDSF field name.
2. The job ID that is part of the fully-qualified data set name is a unique ID that z/OS assigns to the second sysout data set. The job ID displayed in the **lpstat** command is a unique ID that Infoprint Server assigns to the second sysout data set.

The following table summarizes the contents of the SMF type 6 record that IP PrintWay writes for the second sysout data set. For comparison, the table also summarizes the contents before this enhancement.

SMF Type 6 Field	Contents	Contents Before This Enhancement
SMF6JBN	Job name of the original sysout data set	User ID of the job submitter
SMF6USID	User ID of the job submitter	User ID of the user who started the Infoprint Server LPD

The following table summarizes the contents of the XTPUSRID field, which is input to IP PrintWay exit routines. For comparison, the table also summarizes the contents of this field before this enhancement.

Field in ANFUEXTP Control Block	Contents	Contents Before This Enhancement
XTPUSRID	User ID of the job submitter	User ID of the user who started the Infoprint Server LPD

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	None.
Application Development	None.
Auditing	Modify accounting routines if necessary to use changed values.
Customization	Modify IP PrintWay exit routines if necessary to use user ID of job submitter.
Diagnosis	None.
General User	None.
Operations	The operator can now use the job name or job ID to find the second sysout data set on the JES spool.
Interfaces	See "Exits" on page 113 and "SMF Type 6 Record" on page 132.

Dependencies

Apply Infoprint Server PTF UW87646 to obtain this enhancement in z/OS V1R2 and later releases.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only when the listed condition is met. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
Review accounting routines that examine SMF type 6 records to see if changes to fields SMF6JBID, SMF6JBN, and SMF6USID affect them.	Optional	*z/OS Infoprint Server Operation and Administration*
Review IP PrintWay exit routines to see if the change to field XTPUSRID affects them.	Optional	*z/OS Infoprint Server Customization*

IP PrintWay Resubmit for Filtering Enhancements

For More Information

For more detailed information about this support, refer to the following publications:

- *z/OS Infoprint Server Customization*
- *z/OS Infoprint Server Operation and Administration*

IP PrintWay TCP/IP Connection Timeout Enhancement

Description

IP PrintWay now waits a maximum of 30 seconds for TCP/IP to connect to a printer. Prior to this enhancement, IP PrintWay waited up to 3 minutes. Because the IP PrintWay FSA cannot process or print any other data sets while it waits for TCP/IP to connect to the printer, this enhancement can significantly improve performance.

You can change the TCP/IP connection timeout value for each printer in the new **Connection timeout** field in the IP PrintWay Options section of the printer definition. You can specify a value from 5 to 180 seconds; the default value is 30 seconds. If you use the Printer Inventory Definition Utility (PIDU) to edit printer definitions, you can specify the new **connection-timeout** attribute to change the timeout value.

This enhancement applies only when IP PrintWay uses the TCP/IP LPR or direct sockets printing protocol to communicate with the printer. It does not apply to VTAM-controlled or IPP-enabled printers. And, it does not apply when IP PrintWay sends data to an e-mail destination instead of to a printer.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	Change the value in the **Connection timeout** field of printer definitions if desired.
Application Development	None.
Auditing	None.
Customization	None.
Diagnosis	None.
General User	None.
Operations	None.
Interfaces	See "Infoprint Server ISPF Panels" on page 124 and "PIDU Printer Attributes" on page 130.

Dependencies

Apply Infoprint Server PTF UW88108 to obtain this enhancement in z/OS V1R2 and later releases.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only when the listed condition is met. For more details on the procedures associated with a task, see the reference listed.

IP PrintWay TCP/IP Connection Timeout

Task	Condition	Reference Information
Change the value in the **Connection timeout** field of the printer definition if the default value of 30 seconds is not suitable.	Optional	*z/OS Infoprint Server Operation and Administration*

For More Information

For more detailed information about this support, refer to *z/OS Infoprint Server Operation and Administration*.

NetSpool Exit Enhancements

Description

The NetSpool component of Infoprint Server now provides two new exits:

- The Graphic Escape exit (APIUGEX) for SCS and 3270 data streams. Your system programmer can use this exit to map graphic escape sequences to appropriate printable characters in an alternate font. For example, a Graphic Escape ″T″ can be mapped to a telephone symbol in the Wingdings font. A sample Graphic Escape exit (APIJUGEX) provided in SYS1.SAMPLIB shows how to code the new exit.

- The Beginning of File exit (APIUBF3) for 3270 data streams. Your system programmer can use this exit to add PCL commands to the beginning of PCL data streams. For example, your system programmer can add PCL commands to select a font. A sample Beginning of File exit (APIJUBF3) provided in SYS1.SAMPLIB shows how to code the new exit.

Also, NetSpool has enhanced two existing exits and sample exits for SCS data streams:

- NetSpool now passes to the Transparent Data Control exit (APIPPTD2) and Beginning of File exit (APIPPTD1) the type of LU session and the type of output data stream (line or PCL data stream). Therefore, your exits can now perform different functions for different types of sessions and output data streams.

- The sample Transparent Data Control exit (APIJPTD2) and Beginning of File exit (APIJPTD1) now provide additional examples, for example, how to delete and modify transparent data depending on whether the output data stream is a line or PCL data stream.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	None.
Application Development	None.
Auditing	None.
Customization	Optionally, code two new exits and modify existing Transparent Data Control and Beginning of File exits to perform different functions depending on the type of LU session and output data stream.
Diagnosis	None.
General User	None.
Operations	None.
Interfaces	See Table 15 on page 113 and Table 33 on page 136.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only to specified operating environments or to situations where there is more than one way to set up or enable the function. For more details on the procedures associated with a task, see the reference listed.

NetSpool Exits

Task	Condition	Reference Information
Write a Graphic Escape exit if your applications contain Graphic Escape character codes (X'08') that do not print correctly.	Optional	*z/OS Infoprint Server Customization*
Write a 3270 Beginning of File exit if you need to specify PCL commands (or other data) at the beginning of each output data stream. As an alternative, you can continue to specify PCL commands in the **Document header** field of the printer definition.	Optional	*z/OS Infoprint Server Customization*
Modify existing Transparent Data Control and Beginning of File exits for SCS data streams to perform different functions depending on the type of LU session and type of output data stream (line or PCL data stream). No exit changes are required except to take advantage of new function.	Optional	*z/OS Infoprint Server Customization*

For More Information

For more detailed information about this support, refer to *z/OS Infoprint Server Customization*.

NetSpool PCL Conversion

Description

The NetSpool component of Infoprint Server has enhanced its support for printing data from VTAM applications, such as CICS and IMS. NetSpool can now convert VTAM application print data directly to PCL format. This new support provides greater print fidelity on printers that accept the PCL data format, which include most IBM, HP, Lexmark, and other manufacturers' network printers.

In previous releases, NetSpool always converted VTAM application print data streams, either 3270 or SNA Character Set (SCS) data streams, to line data. IP PrintWay can, in turn, convert line data to text data for printing on any printer that accepts text data. Due to limitations in line data, however, NetSpool could not preserve all print-formatting controls in the input data streams; therefore, data did not always print as intended.

When converting to PCL, NetSpool can now preserve additional print-formatting controls in SCS data streams by generating corresponding PCL commands; this results in greater print fidelity. For example, when converting SCS data, Infoprint Server can now:

- Preserve line-density and print-density controls
- Preserve paper-source, output-bin, job-separation, and duplex requests
- Preserve portrait and landscape page orientation
- Automatically change the page orientation and reduce print output on a page–by-page basis

The print administrator can use Infoprint Server ISPF panels to easily customize this new 3270 and SCS to PCL conversion function, on a printer-by-printer basis. For example, the administrator can specify whether the output is to print in the portrait or landscape page orientation.

Limitation: NetSpool does not support TCP/IP translation tables or use DBCS code pages when it converts EBCDIC data to ASCII PCL data streams. Customers who need to use customized TCP/IP conversion tables and DBCS applications should not enable this new function.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	Modify the printer definitions to request that NetSpool convert data streams to PCL format and specify fields that control how NetSpool converts data streams.
Application Development	Modify VTAM applications to add SCS controls, such as the Page Presentation Medium (PPM) control.
Auditing	None.

NetSpool PCL Conversion

Area	Considerations
Customization	• Ensure that the user ID that starts NetSpool is a z/OS UNIX user.
	• Specify no blank truncation for the JES output classes in which NetSpool can allocate data sets.
	• Specify LE and C^{++} run-time libraries in the NetSpool startup procedure; modify LE run-time options.
	• Change default EBCDIC and ASCII code pages in the Infoprint Server configuration file.
	• Add PCL controls in the Beginning of File exit for 3270 data streams; modify existing Transparent Data Control and Beginning of File for SCS exits to perform different functions depending on the type of LU session and output data stream.
Diagnosis	None.
General User	None.
Operations	None.
Interfaces	See Table 20 on page 124, Table 31 on page 135, Table 24 on page 130, and Table 27 on page 133.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that want to enable this function. **Optional** tasks apply only to specified operating environments or to situations where there is more than one way to set up or enable the function. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Procedure Reference
Request PCL conversion in the printer definitions in the Printer Inventory. Select the **Convert to PCL** option in the **Formatting** field.	Required	*z/OS Infoprint Server Operation and Administration*
Edit the new PCL conversion fields in the printer definitions if default values are not suitable: • **Line density** field • **Orientation** field • **Print density** field • **SCS automatic page orientation** field	Optional	*z/OS Infoprint Server Operation and Administration*
Ensure that the user ID that starts NetSpool is a z/OS UNIX user. The user ID must have an OMVS segment and a home directory.	Required[1]	*z/OS Infoprint Server Customization*
Add the CEE.SCEERUN and CBC.SCLBDLL data sets to the NetSpool startup procedures if the LE and C^{++} run-time libraries are not in the system LNKLST, and restart NetSpool. This task is required because NetSpool now runs in the Language Environment® (LE).	Optional	*z/OS Infoprint Server Customization*
Change default LE run-time options if default options are not suitable for your installation.	Optional	*z/OS Infoprint Server Customization*
In the JES2 OUTCLASS statements or JES3 SYSOUT statements, specify no blank truncation for the output classes in which NetSpool can allocate data sets.	Required	*z/OS Infoprint Server Customization*

Task	Condition	Procedure Reference
Change default EBCDIC and ASCII code pages in the Infoprint Server configuration file, **aopd.conf**, if the default values are not suitable because NetSpool now converts EBCDIC data to ASCII representation.	Optional	*z/OS Infoprint Server Customization*
Modify NetSpool exits to perform different processing for different types of VTAM sessions or types of output data streams (line data or PCL data). No exit changes are required except to take advantage of new function.	Optional	*z/OS Infoprint Server Customization*
Understand how NetSpool converts data to PCL format. Add SCS controls to VTAM application print output, such as the Presentation Page Medium (PPM) control, to take full advantage of this new function.	Optional	*z/OS Infoprint Server User's Guide*

1. This task is required by all installations, whether or not the installation enables the new function.

For More Information

For more detailed information about this support, refer to the following Infoprint Server publications:

- *z/OS Infoprint Server Customization*
- *z/OS Infoprint Server Operation and Administration*
- *z/OS Infoprint Server User's Guide*

Print Interface >255 Copies Support

Description

The Print Interface component of Infoprint Server now lets the job submitter request up to 32640 copies of the same document in the **copies** job attribute. This function can be used by any job submitter who can specify Infoprint Server job attributes. In previous releases, the maximum number of copies that could be specified was 255.

Also, the administrator now can specify 32640 copies in the **copies** field of the printer definition for print requests submitted through Print Interface. If the printer definition is shared with NetSpool, and a value larger than 255 is specified, NetSpool uses 255. The administrator can also specify up to 32640 copies in the **Maximum copies** field of the printer definition to limit the number of copies printed.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	The administrator can request up to 32640 copies in the printer definition, but only for print requests submitted through Print Interface.
Application Development	None.
Auditing	None.
Customization	None.
Diagnosis	None.
General User	The job submitter can request up to 32640 copies in a job attribute.
Operations	None.
Interfaces	See Table 20 on page 124, Table 23 on page 128, and Table 24 on page 130.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only to specified operating environments or to situations where there is more than one way to set up or enable the function. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
Specify the **Copies** field in the printer definition, or specify the **copies** job attribute at job submission.	Required	*z/OS Infoprint Server Operation and Administration*, *z/OS Infoprint Server User's Guide*

For More Information

For more detailed information about this support, refer to the following Infoprint Server publications:

- *z/OS Infoprint Server Operation and Administration*
- *z/OS Infoprint Server User's Guide*

Print Interface Infoprint Port Monitor for Windows Enhancements

Description

The Infoprint Port Monitor for Windows Version 2.0 contains the following enhancements:

- The Infoprint Port Monitor runs on Windows Millennium Edition (Me) and Windows XP systems, as well as on Windows 95/98, Windows NT®, and Windows 2000 systems.
- The Infoprint Port Monitor processes data more efficiently because it no longer writes temporary files on the Windows system.
- On Windows NT, Windows 2000, and Windows XP systems, Infoprint Port Monitor errors are permanently recorded in the Windows Event Log.
- The new **Unattended port** option indicates that a printer at an Infoprint port is used by Windows users on other systems. When you select this option, the Infoprint Port Monitor does not display error messages that require a response before other documents can be printed.
- When you install the new version of the Infoprint Port Monitor, you do not need to first uninstall the down-level Infoprint Port Monitor. The install process preserves existing Windows printers and Infoprint port configurations, while automatically upgrading the Infoprint Port Monitor.
- On Windows NT and Windows 2000 systems, the Infoprint Port Monitor install process no longer predefines one Infoprint port. Therefore, the Windows user should follow instructions in the Windows Add Printer wizard to add an Infoprint port.
- Additional help information is incorporated in the Infoprint Port Monitor. Therefore, the Infoprint Port Monitor Readme file is no longer provided.
- To uninstall the new Infoprint Port Monitor, you can now use the standard Windows uninstall process.
- On Windows 2000 and Windows XP systems, the Windows Add/Remove Programs dialog box now displays the version of the Infoprint Port Monitor that is installed.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	None.
Application Development	None.
Auditing	None.
Customization	If you have defined Windows shared printers, select the new **Unattended port** option.
Diagnosis	Use additional error information in the Windows Event Log on Windows NT, Windows 2000, and Windows XP systems.
General User	To use the new Infoprint Port Monitor, the Windows user must download and install it.
Operations	None.
Interfaces	See "Infoprint Port Monitor for Windows" on page 124.

Infoprint Port Monitor for Windows

Dependencies

Apply Infoprint Server PTFs UW86129 and UW87698 to obtain this enhancement in z/OS V1R2 and later releases.

The new Infoprint Port Monitor has the following additional software requirements:

- **Windows 95 systems:** The Windows Socket 2 update is required. You can download the update from the Microsoft® Web site at:

`http://www.microsoft.com/windows95/downloads/contents/wuadmintools/s_wunetworkingtools/w95sockets2/`

- **Windows NT systems:** Version 4.0 or higher is required.

- Microsoft Internet Explorer 3.x (or later) is required in order to view Infoprint Port Monitor online help. You can download the Internet Explorer from the Microsoft Web site at: http://www.microsoft.com/ie/

- If Infoprint Manager Select is installed on the Windows system, Infoprint Manager Select should be at the latest level.

Windows users can continue to use the previous version of the Infoprint Port Monitor for Windows if they do not want to use the enhancements or if they want to use the Japanese translation.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only when the listed condition is met. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
Download and install the new Infoprint Port Monitor. Do not first uninstall the previous version of the Infoprint Port Monitor.	Required	Infoprint Port Monitor online help; *z/OS Infoprint Server User's Guide*
Reconfigure Infoprint ports for Windows shared printers to select the **Unattended port** option.	Optional	Infoprint Port Monitor online help; *z/OS Infoprint Server User's Guide*
On Windows NT, 2000, and XP systems, view error information in the Windows Event Log.	Optional	Infoprint Port Monitor online help

For More Information

For more detailed information about this support, refer to:

- Online help provided with Infoprint Port Monitor.
- *z/OS Infoprint Server Customization*
- *z/OS Infoprint Server User's Guide*

Print Interface IPP Server Java Support

Description

The Print Interface Internet Printing Protocol (IPP) server now requires Java 1.3. It no longer supports Java 1.1.8.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	None.
Application Development	None.
Auditing	None.
Customization	The system programmer must install Java 1.3, authorize the Java run-time libraries, and increase the maximum region size.
Diagnosis	None.
General User	None.
Operations	None.
Interfaces	None

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that use the IPP Server. **Optional** tasks apply only to specified operating environments or to situations where there is more than one way to set up or enable the function. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
Ensure that your installation runs Java 1.3 and that the Java 1.3 libraries are APF-authorized. You can run the AOPJAUTH program to authorize the Java 1.3 libraries. If you did not install Java 1.3 in the default directories, specify the Java directory in the JAVA_HOME environment variable in the new **aopstart** EXEC. Also increase the maximum region size to 100 megabytes (MB). Depending on how you start the IPP server, change the region size in the AOPSTART command, in the BPXPRMxx member of SYS1.PARMLIB, or on the TSO/E logon panel.	Required	*z/OS Infoprint Server Customization*

For More Information

For more detailed information about this support, refer to *z/OS Infoprint Server Customization*.

Print Interface Remote Transform Support for IBM Infoprint Color 130 Plus Printer

Description

The Print Interface component of Infoprint Server now lets you use the PostScript and PDF to AFP™ color transform provided by Infoprint Manager for AIX®. This AIX transform is required to print color PostScript and color PDF files on the IBM Infoprint Color 130 Plus printer. You can now specify the following new options and values on the existing Print Interface remote transform filter, **aoprform.dll**:

- The **-a fs45** option causes the transform to create FS45 image output, which the IBM Infoprint Color 130 printer requires.

- The **-q** option lets you specify the following transform attributes to customize the color transform:

  color-profile={euroscale | none | swop}
  Specifies the color profile that the transform is to use.

  color-rendering-intent={relative | perceptual}
  Specifies how the transform is to process shades that the Infoprint Color 130 Plus cannot reproduce exactly.

  color-toner-saver={ no | yes}
  Specifies whether the transform is to reduce the amount of color toner used by the printer.

  presentation-object-container-extraction-mode={ignore | inline}
  Specifies how the transform generates presentation object container resources in the output stream.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	Specify the AIX color transform in the printer definition for an IBM Infoprint Color 130 Plus printer.
Application Development	None.
Auditing	None.
Customization	None.
Diagnosis	None.
General User	Modify color transform attributes when submitting a job.
Operations	None.
Interfaces	See "Filters" on page 122 and "/usr/lpp/Printsrv/samples/ Directory" on page 138.

Dependencies

Apply Infoprint Server PTF UW85327 to obtain this enhancement in z/OS V1R2 and later releases.

Infoprint Manager for AIX V3R2 (5785–E42) or later is required.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only to specified operating environments or to situations where there is more than one way to set up or enable the function. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
In the printer definition for an IBM Infoprint Color 130 Plus printer, specify the **aoprform.dll** filter with the **-a fs45** option for the PostScript and PDF data formats. Optionally, specify color transform attributes in the **-q** option.	Required	*z/OS Infoprint Server Operation and Administration*
Modify color transform attributes by specifying the **-q** attribute with the **filter-options** attribute when you submit a job. This function is available for job submission methods that let you specify Infoprint Server job attributes.	Optional	*z/OS Infoprint Server User's Guide*

For More Information

For more detailed information about this support, refer to the following publications:

- *z/OS Infoprint Server Operation and Administration*
- *z/OS Infoprint Server User's Guide*
- *IBM Infoprint Color 130 Plus Installation Planning Guide*
- *IBM Infoprint Manager for AIX: Administrator'sGuide*
- *IBM Infoprint Manager: Reference*

Print Interface Subsystem for Batch Applications

Description

The Print Interface subsystem provides enhanced support for batch applications. Batch applications can now use the automatic transform function provided by Print Interface. The Print Interface subsystem can automatically detect the data format of most data sets and, using transforms provided by Infoprint Server Transforms, transform the data to the format required by the printer or e-mail destination before writing the data to the JES spool.

A batch application might want to use the Print Interface subsystem in the following situations:

- To transform batch application output that contains PCL, PostScript, or PDF data to AFP format and print it on IBM AFP printers controlled by PSF for OS/390.

- To transform batch application output that contains line data or AFP data to PCL or PostScript format and print it on PCL or PostScript printers controlled by IP PrintWay

- To transform batch application output that contains line data or AFP data to PDF format and send it to e-mail destinations.

- To specify Infoprint Server job attributes.

Your installation can use the Print Interface subsystem in situations where you now might use the IP PrintWay resubmit for filtering function. The subsystem provides these advantages over the resubmit for filtering function:

- The subsystem is more efficient because it transforms data *before* writing it to the JES spool; therefore, data is written to the JES spool only one time.

- The job submitter can code the DEST=IP, PRTQUEUE, and PORTNO parameters on the OUTPUT JCL statement to override the printer's IP address in the printer definition. If your installation wants to minimize the administration of printer definitions, this means that the administrator can define one IP PrintWay printer definition for all printers that have the same printing requirements.

- The application programmer can specify Infoprint Server job attributes on the DD statement.

To use the Print Interface subsystem, the application programmer specifies the SUBSYS parameter on the DD JCL statement for the data set. SUBSYS subparameters include the name of the Print Interface subsystem, the name of a printer definition defined in the Infoprint Server Printer Inventory, and optional Infoprint Server job attributes. The Print Interface subsystem also supports most parameters of the DD and OUTPUT JCL statements that are supported for JES sysout data sets. Because the administrator can specify default values for the supported JCL parameters in the printer definition, the application programmer does not need to code JCL parameters that have suitable default values.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	Create printer definitions in the Printer Inventory. In the printer definitions, specify data stream transforms.
Application Development	Specify the SUBSYS parameter on the DD statement for data sets that need to be transformed to another data format.

Area	Considerations
Auditing	Review accounting routines that examine SMF type 6 records written by PSF.
Customization	• Customize data transforms you plan to use if they are not already customized. • Customize Print Interface and the Print Interface subsystem.
Diagnosis	None.
General User	See the Application Development section of this table.
Operations	Start and stop the Print Interface subsystem.
Interfaces	See "Configuration Files" on page 111, "Exits" on page 113, "JCL Parameters on OUTPUT and DD Statements" on page 126, "Startup and Shutdown Procedures" on page 133, and "z/OS UNIX Commands" on page 139.

Dependencies

Apply Infoprint Server PTF UW88209 to obtain this enhancement in z/OS V1R2 and later releases.

To transform PCL, PostScript, and PDF data to AFP format, the Transforms to AFP feature of Infoprint Server Transforms (5697–F51) is required. This feature is available at no extra charge to Infoprint Server customers.

To transform line or AFP data to another format, the following priced features of Infoprint Server Transforms are required:

• AFP to PCL feature
• AFP to PDF feature
• AFP to PostScript feature

To print to IBM AFP printers, PSF for OS/390 (5655–B17) is required.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only to specified operating environments or to situations where there is more than one way to set up or enable the function. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
Customize the required transforms. If you have already customized transforms, no additional customization is requred.	Required	*z/OS Infoprint Server Customization*
In the JES2 OUTCLASS statements or JES3 SYSOUT statements, specify no blank truncation for all JES output classes in which the Print Interface subsystem can allocate data sets.	Required	*z/OS Infoprint Server Customization*
If you do not already run Print Interface, edit the BPXPRMxx member of SYS1.PARMLIB to increase the maximum number of active processes.	Required	*z/OS Infoprint Server Customization*

Print Interface Subsystem

Task	Condition	Reference Information
Edit the Infoprint Server configuration file to request that the Print Interface subsystem daemon be started.	Required	*z/OS Infoprint Server Customization*
Increase the maximum number of transform daemons that can be active if jobs use the Print Interface subsystem to write data to multiple data sets in the same job step.	Optional	*z/OS Infoprint Server Customization*
Create printer definitions in the Printer Inventory and request the appropriate transforms in the printer definitions. No changes are required to existing printer definitions that already request transforms.	Required	*z/OS Infoprint Server Operation and Administration*
Start the Print Interface subsystem daemon.	Required	*z/OS Infoprint Server Operation and Administration*
On the DD statements for data sets that need to be transformed to another data format, specify the SUBSYS parameter with the following subparameters: • Name of the Print Interface subsystem • Name of the printer definition • Infoprint Server job attributes Code other supported parameters on DD and OUTPUT JCL statements.	Required	*z/OS Infoprint Server User's Guide*
Stop the Print Interface subsystem if a problem occurs.	Optional	*z/OS Infoprint Server Operation and Administration*
Review accounting routines that examine SMF type 6 records written by PSF. If the Print Interface subsystem is used, the SMF6USID field contains the user ID of the user who started the subsystem.	Optional	*z/OS Infoprint Server Operation and Administration*

For More Information

For more detailed information about this support, refer to the following publications:

- *z/OS Infoprint Server Customization*
- *z/OS Infoprint Server Operation and Administration*
- *z/OS Infoprint Server User's Guide*

PSF for OS/390 FSA Definition Enhancements

Description

Infoprint Server now lets the PSF system programmer specify additional configuration information in the Printer Inventory. PSF for OS/390 can use this information when it starts a PSF-controlled printer. The following new fields can be specified in the FSA definition:

- **Retained Resource Counts** fields: These fields let you specify the number of form definitions, page definitions, page segments, fonts, and object containers that you want PSF to retain in printer storage or virtual storage between print jobs.

  These values override the reasonable resource loading values (RRLV) that you can specify in the PSF Exit 7 initialization call.

- **Save printer characteristics** field: This field lets you request that PSF save information about the printer, including the printer's model and supported features, to assist IBM in diagnosing problems.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	None.
Application Development	None.
Auditing	None.
Customization	Specify new fields in the FSA definition for a PSF for OS/390 printer.
Diagnosis	Specify the **Save printer characteristics** field to assist IBM in diagnosing problems.
General User	None.
Operations	None.
Interfaces	See "Infoprint Server ISPF Panels" on page 124 and "PIDU Printer Attributes" on page 130.

Dependencies

Apply Infoprint Server PTF UW83615 to obtain this enhancement in z/OS V1R2 and later releases.

Not all releases of PSF support these new fields. Refer to *PSF for OS/390 & z/OS: Customization* to see if your release of PSF supports them.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only to specified operating environments or to situations where there is more than one way to set up or enable the function. For more details on the procedures associated with a task, see the reference listed.

PSF FSA Definition Enhancements

Task	Condition	Reference Information
Specify the new fields in the Printer Inventory if the default values are not suitable, and restart the printer to pick up the changes.	Optional	*z/OS Infoprint Server Customization*

For More Information

For more detailed information about this support, refer to *z/OS Infoprint Server Customization*.

Sample Customization Files

Description

Infoprint Server now provides the following new sample files in SYS1.SAMPLIB. These files can help installations customize Infoprint Server for the first time:

- AOPCPETC: This file copies all of the Infoprint Server sample configuration files to a directory where you can edit them.
- AOPRACF: This file contains all the RACF commands you need in order to customize the security function in Infoprint Server.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	None.
Application Development	None.
Auditing	None.
Customization	The system programmer can now use the new sample files to customize Infoprint Server.
Diagnosis	None.
General User	None.
Operations	None.
Interfaces	See Table 33 on page 136.

Migration Tasks

No new migration tasks are associated with this enhancement. This enhancement helps installations customize Infoprint Server for the first time.

For More Information

For more detailed information about this support, refer to *z/OS Infoprint Server Customization.*

Secure Environment

Description

In order to provide a more secure environment for Infoprint Server, all installations must now define certain environment variables that Infoprint Server uses in a new **aopstart** REXX EXEC, which replaces the existing **aopstart** command. The **aopstart** EXEC must be owned by UID of 0.

Your installation can copy and modify the new **aopstart** EXEC if you need to change the environment variables that are specified in the default **aopstart** EXEC shipped with Infoprint Server. The default **aopstart** EXEC is suitable for most installations.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	None.
Application Development	None.
Auditing	None.
Customization	Customize the new **aopstart** EXEC to specify or change environment variables.
Diagnosis	None.
General User	None.
Operations	None.
Interfaces	See Table 36 on page 139.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations. **Optional** tasks apply only to specified operating environments or to situations where there is more than one way to set up or enable the function. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
Specify environment variables in the **aopstart** EXEC if any of the following conditions apply: • Infoprint Server executable files, message files, and configuration files are not in the default locations • Infoprint Server Transforms configuration files are not in the default locations • LE and C^{++} run-time libraries are not in SYS1.LNKLST • You have defined multiple TCP/IP stacks • You run the Infoprint Server SAP Output Management System (OMS) • You run the Print Interface IPP server and Java 1.3 libraries are not in the default directories • You want to change the default trace directory	Optional	*z/OS Infoprint Server Customization*
Ensure that the **/etc/Printsrv** directory, the **aopd.conf** file, and the **aopxfd.conf** file are writeable only by a user with an effective user ID of 0. This ensures the most secure environment.	Optional	*z/OS Infoprint Server Customization*
Remove any Infoprint Server environment variables from the **/etc/rc** file that are now defined in the **aopstart** command. These environment variables will be ignored if specified in the **/etc/rc** file.	Optional	*z/OS Infoprint Server Customization*
Remove the AOPXFD_CONF environment variable from the **/etc/profile** file. This environment variable is ignored when specified in the **/etc/profile** file.	Optional	*z/OS Infoprint Server Customization*

For More Information

For more detailed information about this support, refer to *z/OS Infoprint Server Customization*.

Secure Environment

Chapter 4. OS/390 Version 2 Release 8 Overview

The following sections describe the new and changed functions that were introduced to Infoprint Server and Infoprint Server Transforms in OS/390 Version 2 Release 8 (V2R8). The information about each item includes:
- Description
- Summary of the Infoprint Server tasks or interfaces that may be affected
- Coexistence considerations, if any, that are associated with the item
- Migration tasks, if any, that are associated with the item
- References to other publications that contain additional detailed information

Note: Some migration tasks are required whether or not your installation plans to use a new or changed function. See "Actions Required for All Migrations" on page 4 for the migration tasks that are required by *all* installations, even if your installation does not plan to implement any of the new functions.

Release Summary

Table 10 lists the enhancements to Infoprint Server in OS/390 V2R8. For more information, refer to the detailed section for each item.

Table 10. Summary of Infoprint Server Enhancements for OS/390 Version 2 Release 8

For Information About:	See Page:
Printer Inventory	53
Transforms	60
AFP to PCL, AFP to PDF, and AFP to PostScript Transforms	62
Kanji AFP Print Feature	65
Transform Enhancements	66
Print Interface Remote Transforms	68
Print Interface IPP Server	70
Print Interface Dynamic Allocation Enhancements	71
Print Interface AOPPRINT JCL Procedure	72
Print Interface lp Command Enhancements	73
Print Interface SMB Protocol Support	76
Infoprint Port Monitor for Windows Enhancements	78
Print Interface Filter Enhancements	79
Print Interface API	80
Print Interface SAP Output Management System	81
Print Interface LPD Compatibility Filter	83
NetSpool Operator Command Enhancements	85
NetSpool Dynamic Allocation Enhancement	87
IP PrintWay Startup Enhancements	88
IP PrintWay IPP Client	90
IP PrintWay Printer Selection with FSSDATA JCL Parameter	92
IP PrintWay Extended Routing Criteria	94
IP PrintWay Code Page Conversion	96

Table 10. Summary of Infoprint Server Enhancements for OS/390 Version 2 Release 8 (continued)

For Information About:	See Page:
IP PrintWay Printer Instruction Enhancements	98
IP PrintWay Coordination with Print Interface and NetSpool	99
IP PrintWay Restrict Ports	101
IP PrintWay Transform Function	102
IP PrintWay VTAM Printer Support	104
SNMP Subagent	106
PSF for OS/390 Startup Enhancements	108

Printer Inventory

Description

All Infoprint Server components now use a common Printer Inventory managed by a new Infoprint Server component, the Printer Inventory Manager. The administrator can create the following types of entries in this Printer Inventory:

- **Printer definitions:** The administrator creates a printer definition for each printer to which NetSpool, Print Interface, or IP PrintWay can print. The same definition contains all printer information required by NetSpool, Print Interface, and IP PrintWay.

- **Components:** To manage a large number of printer definitions, the administrator can create components. Components contain printer information common to more than one printer definition; one component can be included in multiple printer definitions.

- **Printer pool definitions:** If your installation uses NetSpool, the administrator can create printer pool definitions. Printer pool definitions list the printer definitions to which NetSpool can broadcast data.

- **FSS and FSA definitions:** If your installation uses IP PrintWay or PSF for OS/390, the administrator can create FSS definitions and FSA definitions to specify IP PrintWay or PSF configuration information.

The administrator uses new Infoprint Server ISPF panels to create and manage entries in the Printer Inventory. The administrator can also use the Printer Inventory Definition Utility (PIDU) to create and edit large numbers of entries at one time.

Infoprint Server provides a migration program to help migrate existing IP PrintWay, NetSpool, and Print Interface printer information to the Printer Inventory. See Chapter 6, "Infoprint Server Migration Program" on page 141 for more information. You must provide the existing IP PrintWay routing and options data sets; NetSpool print-characteristics data sets, tables, and startup procedures; and Print Interface printer inventory as input to this migration program.

Note: Do not confuse the new Infoprint Server Printer Inventory with the Print Interface printer inventory from previous releases. The Print Interface printer inventory is now obsolete.

What This Change Affects

This support affects the following areas of Infoprint Server processing. Use the table for the Infoprint Server component from which you are migrating (Print Interface, NetSpool, or IP PrintWay).

Printer Inventory

The following table describes areas affected in installations that currently run Print Interface.

Area	Considerations for Print Interface
Administration	The administrator no longer creates printer definitions in the Print Interface printer inventory. Instead, the administrator creates printer definitions and, optionally, components in the Printer Inventory. The administrator no longer uses Print Interface ISPF panels to create printer definitions. Instead, the administrator uses Infoprint Server ISPF panels and, optionally, the PIDU program to create and manage entries in the Printer Inventory.
Application Development	None.
Auditing	None.
Customization	The system programmer must set the NLSPATH environment variable to a new value for English messages and periodically back up the Printer Inventory. The Infoprint Server configuration file also now lets you specify a name for the Printer Inventory.
Diagnosis	Print Interface messages might now report errors from the Printer Inventory Manager. To diagnose problems related to the Printer Inventory, the diagnostician might need to use the Infoprint Server trace commands.
General User	None.
Operations	The operator can start the Printer Inventory Manager using either the **aopstart** command or a new startup procedure provided with Infoprint Server.
Interfaces	See Chapter 5, "Summary of Interface Changes" on page 109 for the interface changes related to the Printer Inventory enhancement.

The following table describes areas affected in installations that currently run NetSpool.

Area	Considerations for NetSpool
Administration	The administrator no longer specifies printer information in a NetSpool print-characteristics data set or in IP PrintWay routing and options data sets; and the administrator no longer creates entries in end-of-file rules tables and default page-format tables. Instead, the administrator specifies the same information in printer definitions in the Printer Inventory.
	Optionally, the administrator can specify some printer information in components that are included in several printer definitions. For example, instead of specifying end-of-file rules in a NetSpool end-of-file rules entry, the administrator can specify the same information in a NetSpool End-of-File component in the Printer Inventory; instead of specifying default page-format information in a page-format entry, the administrator can specify the same information in a Processing component in the Printer Inventory.
	Instead of concatenating OUTPUT JCL statements in the NetSpool startup procedure to broadcast data to multiple printers, the administrator now creates printer pool definitions in the Printer Inventory.
	The administrator no longer uses the APIPPEFM and APIPPDPF macros to create the end-of-file rules table and page-format table. The administrator now uses Infoprint Server ISPF panels and, optionally, the PIDU program to create and manage entries in the Printer Inventory.
Application Development	None.
Auditing	Access to the Printer Inventory and commands to start and stop the Printer Inventory Manager is controlled by permitting users to RACF® groups AOPOPER and AOPADMIN.
Customization	The system programmer must now customize the Printer Inventory Manager. NetSpool startup procedures must identify the Printer Inventory, and concatenated OUTPUT JCL statements are no longer required to broadcast data to multiple printers; see "NetSpool Dynamic Allocation Enhancement" on page 87 for additional changes to NetSpool startup procedures. Also, NetSpool exits must now be APF authorized.
Diagnosis	NetSpool messages can now report errors from the Printer Inventory Manager. To diagnose problems related to the Printer Inventory, the diagnostician might need to use Infoprint Server trace commands and the Infoprint Server ISPF trace facility. Also, NetSpool now generates SVC dumps instead of ABEND dumps.
General User	None.
Operations	The operator must start the Printer Inventory Manager before starting NetSpool, using either the **aopstart** command or a startup procedure. The operator no longer needs to use the REFRESH and RELOAD operator commands because NetSpool automatically picks up changes made in the Printer Inventory. The operator no longer needs to use the LUNAME ADD command to start a NetSpool printer LU after NetSpool is started, because NetSpool automatically starts newly defined printers that are in one of the started classes. See "NetSpool Operator Command Enhancements" on page 85 for additional changes to NetSpool operator commands.
Interfaces	See Chapter 5, "Summary of Interface Changes" on page 109 for the interface changes related to the Printer Inventory enhancement.

Printer Inventory

The following table describes areas affected in installations that currently run IP PrintWay.

Area	Considerations for IP PrintWay
Administration	The administrator no longer creates routing entries in a routing data set and options entries in an options data set. Instead, the administrator specifies routing and options information together in printer definitions.
	Optionally, the administrator can specify some printer information in components that are included in several printer definitions. For example, instead of specifying options in an IP PrintWay options entry, the administrator can specify the same information in Processing, IP PrintWay Options, and Protocol components in the Printer Inventory.
	The administrator no longer uses IP PrintWay ISPF panels or the ANFGPWFL macro to create routing and options entries. Instead the administrator uses Infoprint Server ISPF panels and, optionally, the PIDU program to create and manage entries in the Printer Inventory.
Application Development	None.
Auditing	Access to the Printer Inventory and to commands that start and stop the Printer Inventory Manager are controlled by permitting users to RACF groups AOPOPER and AOPADMIN.
Customization	The system programmer must now customize the Printer Inventory Manager.
	The IP PrintWay startup procedure must identify the Printer Inventory instead of the routing and options data sets. See "IP PrintWay Startup Enhancements" on page 88 for additional changes to the startup procedure. Also, the user ID that starts IP PrintWay must be defined as a z/OS UNIX user.
	Because data area ANFUEXTP has changed, exits that inspect or modify IP PrintWay options must now use new input and output field names.
	Because the format of the IP PrintWay transmission queue has changed, a new transmission-queue data set must be allocated and initialized.
Diagnosis	IP PrintWay messages might now report errors from the Printer Inventory Manager. To diagnose problems related to the Printer Inventory, the diagnostician might need to use Infoprint Server trace commands and the Infoprint Server ISPF trace facility.
General User	None.
Operations	The operator must now start the Printer Inventory Manager before starting IP PrintWay, using either the **aopstart** command or a startup procedure. The operator now uses Infoprint Server ISPF panels, instead of IP PrintWay ISPF panels, to manage the IP PrintWay transmission-queue data set and to view the IP PrintWay message-log data set.
Interfaces	See Chapter 5, "Summary of Interface Changes" on page 109 for the interface changes related to the Printer Inventory enhancement.

Dependencies

Before NetSpool or IP PrintWay starts, the Printer Inventory Manager must be customized and started.

Coexistence Considerations

The Printer Inventory *cannot* be shared with any Infoprint Server components running at the *same* or *different* levels on other systems.

Because the IP PrintWay transmission-queue data set is a VSAM data set, it can be shared with instances of IP PrintWay running at the *same* level on other systems; however, because the format of the transmission-queue has changed, this data set *cannot* be shared with another instance of IP PrintWay running at a *previous* level on another system. Refer to *z/OS Infoprint Server Customization* for reasons why you might want to share the transmission-queue data set.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to *all* installations. **Optional** tasks apply only when the condition is met. For more details on the procedures associated with a task, see the reference listed.

The following table describes migration tasks for installations that currently run Print Interface.

Task for Migrating from Print Interface	Condition	Reference Information
Keep your Print Interface configuration file in the same directory; its default location is **/etc/Printsrv/aopd.conf**. Optionally, add the **inventory** statement to change the name of the Printer Inventory.	Required	*z/OS Infoprint Server Customization*
Change the NLSPATH environment variable in **/etc/profile** to specify **/usr/lpp/Printsrv/En_US/%N** or **/usr/lpp/Printsrv/%L/%N**. (Note the change to an uppercase E in En_US.)	Required	*z/OS Infoprint Server Customization*
Stop and restart the Printer Inventory Manager daemon (**aopd**). Restart this daemon *before* creating the Printer Inventory.	Required	*z/OS Infoprint Server Operation and Administration*
Run the migration program and the PIDU program to create printer definitions in the Printer Inventory from printer definitions in the Print Interface OS/390 V2R5-V2R7 printer inventory.[1]	Required	Chapter 6, "Infoprint Server Migration Program" on page 141
Concatenate library AOP.SAOPEXEC to the SYSEXEC statement in your TSO logon procedures; remove the ANF.SANFEXEC library, which is obsolete.	Required	*z/OS Infoprint Server Customization*
Customize ISPF to include an entry for the Infoprint Server ISPF panels.	Optional: If you do not use the standard ISPF panels provided with z/OS.	z/OS Program Directory

Printer Inventory

Task for Migrating from Print Interface	Condition	Reference Information
Use Infoprint Server ISPF panels or the PIDU program to create or edit printer definitions.	Optional: To create or edit printer definitions	*z/OS Infoprint Server Operation and Administration*
Use new diagnostic procedures for problems with the Printer Inventory.	Optional: If problems arise	*z/OS Infoprint Server Messages and Diagnosis*

1. Run the migration program *once* to migrate from Print Interface, NetSpool, and IP PrintWay at the same time.

The following table describes migration tasks for installations that currently run NetSpool.

Task for Migrating from NetSpool	Condition	Reference Information
Customize the Printer Inventory Manager.	Required	*z/OS Infoprint Server Customization*
Start the Printer Inventory Manager daemon (**aopd**). Start this daemon *before* creating the Printer Inventory and *before* restarting NetSpool.	Required	*z/OS Infoprint Server Operation and Administration*
Run the Infoprint Server migration program and the PIDU program to create printer definitions in the Printer Inventory from NetSpool printer definitions, page format tables, and end-of file rules tables.[1]	Required	Chapter 6, "Infoprint Server Migration Program" on page 141
Change your NetSpool startup procedures to specify the INV parameter (with the name of the Printer Inventory) and to remove unused parameters (WTOR). Restart NetSpool with the new startup procedure.	Required	*z/OS Infoprint Server Customization*
Modify your NetSpool operator procedures as described in "What This Change Affects" on page 53.	Required	*z/OS Infoprint Server Operation and Administration*
Link-edit your NetSpool exits into APF-authorized libraries.	Optional: If you use NetSpool exits	*z/OS Infoprint Server Customization*
Use the Infoprint Server ISPF panels or the PIDU program to create or edit printer definitions.	Optional: To create or edit printer definitions	*z/OS Infoprint Server Operation and Administration*
Use new diagnostic procedures to diagnose problems in the Printer Inventory Manager.	Optional: If problems arise	*z/OS Infoprint Server Messages and Diagnosis*

1. Run the migration program *once* to migrate from Print Interface, NetSpool, and IP PrintWay at the same time.

The following table describes migration tasks for installations that currently run IP PrintWay.

Task for Migrating from IP PrintWay	Condition	Reference Information
Customize the Printer Inventory Manager.	Required	*z/OS Infoprint Server Customization*
Start the Printer Inventory Manager daemon (**aopd**). Start this daemon *before* creating the Printer Inventory and *before* restarting IP PrintWay.	Required	*z/OS Infoprint Server Operation and Administration*
Run the Infoprint Server migration program and the PIDU program to migrate existing IP PrintWay routing and options data sets to the Printer Inventory.[1]	Required	Chapter 6, "Infoprint Server Migration Program" on page 141
Delete your existing IP PrintWay transmission queue data set. Allocate and initialize a new transmission-queue data set.	Required	*z/OS Infoprint Server Customization*
Ensure that the user ID that starts IP PrintWay is a z/OS UNIX user ID. The user ID must have an OMVS segment and a home directory.	Required	*z/OS Infoprint Server Customization*
Change the IP PrintWay startup procedure to specify the INV parameter (with the name of the Printer Inventory) and to remove unused parameters. Restart IP PrintWay FSAs and FSS to pick up changes to the startup procedure.	Required	*z/OS Infoprint Server Customization*
Remove OS/390 V2R5-V2R7 IP PrintWay libraries from your TSO logon procedures; IP PrintWay libraries have high level qualifier ANF.	Required	*z/OS Infoprint Server Customization*
Inspect IP PrintWay exit routines; recode any that modify options. Recompile all IP PrintWay exit routines.	Optional: If you use IP PrintWay exits	*z/OS Infoprint Server Customization*
Use the Infoprint Server ISPF panels or the PIDU program to create or edit printer definitions.	Optional: To create or edit printer definitions	*z/OS Infoprint Server Operation and Administration*
Use new diagnostic procedures for problems in the Printer Inventory Managers.	Optional: If problems arise	*z/OS Infoprint Server Messages and Diagnosis*

1. Run the migration program *once* to migrate from Print Interface, NetSpool, and IP PrintWay at the same time.

For More Information

For more detailed information about this support, refer to the following Infoprint Server publications:

- *z/OS Infoprint Server Customization*
- *z/OS Infoprint Server Operation and Administration*
- *z/OS Infoprint Server Messages and Diagnosis*

Transforms

Description

Infoprint Server Transforms is a separate licensed program product available with Infoprint Server. It consists of a base Transforms to AFP feature and several optional features. The Transforms to AFP feature is available at no extra cost to Infoprint Server customers.

The Transform to AFP feature provides transforms that convert data to Advanced Function Presentation (AFP) format (also called MO:DCA-P) for printing on IBM AFP printers (also called IPDS printers). These transforms are:

- Printer Control Language (PCL) 5e to AFP transform
- PostScript Language Level 3 to AFP transform
- Portable Data Format (PDF) 1.2 to AFP transform
- SAP Output Text Format (OTF) Versions 1 and 2 and Advanced Business Application Programming (ABAP) Versions 1 and 2 to AFP

These transforms also provide:

- z/OS UNIX commands, **pcl2afp**, **pdf2afp**, **ps2afp**, and **sap2afp**, which let users transform data in a UNIX file or MVS data set and create an output UNIX file or MVS data set. Output from these commands can be printed or sent to another location for printing or viewing.
- Transform filters, which Print Interface can use to convert data before writing output to the JES spool.

Infoprint Server has added the following support for transforms:

- Print Interface can invoke the new transform filters if requested in the printer definition.
- A new Transform Manager component of Infoprint Server manages the PCL and PostScript/PDF to AFP transform daemons provided with Infoprint Server Transforms.
- A new **filter-options** job attribute lets users specify transform options on the **lp** command, in the AOPPRINT JCL procedure, and with any other print-submission method that lets you specify Infoprint Server job attributes.

Note: For information about optional features of Infoprint Server Transforms, see "AFP to PCL, AFP to PDF, and AFP to PostScript Transforms" on page 62 and "Kanji AFP Print Feature" on page 65.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	The administrator can specify the filter for the desired transform in the printer definitions for the target printers.
Application Development	None.
Auditing	None.
Customization	The system programmer must customize Infoprint Server Transforms and the Transform Manager.
Diagnosis	None.

Area	Considerations
General User	An Infoprint Server user can use the z/OS UNIX transform commands to transform PCL, PostScript, PDF, or SAP data to AFP format. An Infoprint Server user can print PCL, SAP, PostScript, or PDF documents to IBM AFP printers and can specify transform options in the **filter-options** job attribute.
Operations	The operator must start the Transform Manager unless your installation uses only the SAP to AFP transform.
Interfaces	See Chapter 5, "Summary of Interface Changes" on page 109 for the interface changes related to Transforms.

Dependencies

To use transforms, you must order and install Infoprint Server Transforms. NetSpool does not use transforms provided by Infoprint Server Transforms; however, IP PrintWay now supports transforms; see "IP PrintWay Transform Function" on page 102 for information.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only when the listed condition is met. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
Customize Infoprint Server Transforms and the Transform Manager.	Required	*z/OS Infoprint Server Customization*
Specify transform filters in printer definitions.	Optional: To transform data automatically while printing	*z/OS Infoprint Server Operation and Administration*
Start the Transform Manager.	Optional: To transform PCL, PDF, and PostScript data (not required for SAP transform)	*z/OS Infoprint Server Operation and Administration*
Use **pcl2afp**, **ps2afp**, **pdf2afp**, and **sap2afp** commands.	Optional: To transform data without printing	*z/OS Infoprint Server User's Guide*
Specify transform options in the **filter-options** job attribute when submitting a print job.	Optional: To specify options for special printing needs	*z/OS Infoprint Server User's Guide*

For More Information

For more detailed information about this support, refer to the following Infoprint Server publications:
* *z/OS Infoprint Server Customization*
* *z/OS Infoprint Server Operation and Administration*
* *z/OS Infoprint Server User's Guide*
* *z/OS Infoprint Server Messages and Diagnosis*

Refer to the Infoprint Server Transforms Program Directory for installation information. It can be viewed on the Web at: `http://www.ibm.com/printers/`

AFP to PCL, AFP to PDF, and AFP to PostScript Transforms

Description

Infoprint Server Transforms is a separate licensed program product available with Infoprint Server. It consists of the base Transforms to AFP feature and several optional features.

Three optional priced features of Infoprint Server Transforms provide transforms that convert Advanced Function Presentation (AFP) data and line data to other data formats. These transforms are:

- AFP to Printer Control Language (PCL) 5, 5e, or 5c (color) transform
- AFP to Portable Data Format (PDF) 1.2 (monochrome or color) transform
- AFP to PostScript Language Level 2 (monochrome or color) transform

These transforms also provide:

- z/OS UNIX commands, **afp2pcl**, **afp2pdf**, and **afp2ps**, which let users transform data in a UNIX file or MVS data set and create an output UNIX file or MVS data set. Output from these commands can be printed or sent to another location for printing or viewing. Users can specify AFP parameters, such as a form definition and AFP resource libraries, in Infoprint Server job attributes.
- Transform filters, which Print Interface can use to convert data before writing output to the JES spool.

In support of these transforms, Infoprint Server now provides the following functions:

- Two new job attributes, **input-tray-number** and **output-bin-number**, let users specify input tray and output bin numbers to override the tray and bin numbers in the form definition. Users can still specify tray and bin names in the **input-tray** and **output-bin** job attributes.
- Print Interface no longer rejects print requests that specify job attributes that do not apply to the target printer; instead, Print Interface ignores job attributes that do not apply. Print Interface still can validate the values that are specified in job attributes.
- IP PrintWay transmits the following additional parameters to Infoprint Manager for AIX: -ODUPLEX, -OINTRAY, -OOFFSETXB, -OOFFSETXF, -OOFFSETYB, -OOFFSETYF, -OOUTBIN, and the SOSI3 value in -OPRMODE.

Note: For information about the Transforms to AFP feature of Infoprint Server Transforms, see "Transforms" on page 60. For information about another optional feature of Infoprint Server Transforms, see "Kanji AFP Print Feature" on page 65.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	The administrator can specify a filter for a transform in the printer definition for the target printer.
Application Development	None.
Auditing	None.

AFP to PCL, AFP to PDF, and AFP to PostScript Transforms

Area	Considerations
Customization	The system programmer must customize the transforms. The system programmer must also customize the Infoprint Server Transform Manager unless it has already been customized.
Diagnosis	The diagnostician can use a new trace facility provided by these transforms.
General User	A local z/OS user can use the z/OS UNIX transform commands to convert AFP data and line data. Local z/OS and remote users can print AFP or line data to PCL and PostScript printers. AFP parameters can be specified in job attributes or JCL parameters. The user can also use two new job attributes to specify tray and bin numbers.
Operations	The operator must restart the Infoprint Server Transform Manager.
Interfaces	See "Configuration Files" on page 111, "Filters" on page 122, "Job Attributes" on page 128, "z/OS UNIX Commands" on page 139, "SYS1.SAMPLIB Members" on page 135, and "/usr/lpp/Printsrv/samples/ Directory" on page 138.

Dependencies

To use any of these transforms, the following software is required:

* The AFP to PCL, AFP to PDF, or AFP to PostScript feature of Infoprnt Server Transforms
* AFP Font Collection Version 1 (5648-113) or Version 2 (5648-B33) is required to provide 300-pel raster fonts and outline fonts.
* Sonoran Equivalent Fonts PRPQ 8A5061 (5799-FLK) to transform documents that contain Sonoran Serif or Sonoran Sans Serif fonts.
* An AFP page definition and form definition are required for error messages issued by the transforms. Other AFP resources that are not included inline in the documents are also required.

NetSpool does not use transforms provided by Infoprint Server Transforms. However, IP PrintWay now supports transforms; see "IP PrintWay Transform Function" on page 102 for information.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only when the listed condition is met. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
Customize Infoprint Server Transforms and the Transform Manager.	Required	*z/OS Infoprint Server Customization*
Add an entry for each transform you want to use in the transform configuration file, **aopxfd.conf**, and restart the Transform Manager.	Required	*z/OS Infoprint Server Customization*
Run the AOXCF30 program to scale 240-pel fonts to 300-pel raster fonts; sample JCL is in SYS1.SAMPLIB(AOXCF30J).	Optional: If your installation has only 240-pel raster fonts.	*z/OS Infoprint Server Customization*

AFP to PCL, AFP to PDF, and AFP to PostScript Transforms

Task	Condition	Reference Information
Modify the font-mapping table, AOXFONTS. Apply a usermod to replace the table in each transform.	Optional: To map custom AFP fonts	*z/OS Infoprint Server Customization*
Specify transform filters and AFP parameters that are used by the transforms in printer definitions.	Optional: To transform data automatically while printing	*z/OS Infoprint Server Operation and Administration*
Specify AFP parameters in job attributes or on an OUTPUT JCL statement when submitting a print job.	Optional: To specify AFP parameters that are not specified in a printer definition.	*z/OS Infoprint Server User's Guide*
Use the **afp2pcl**, **afp2pdf**, and **afp2sap** commands.	Optional: To transform data without printing	*z/OS Infoprint Server User's Guide*
Use new tracing procedures to diagnose problems in the transforms.	Optional: If problems arise	*z/OS Infoprint Server Messages and Diagnosis*

For More Information

For more detailed information about this support, refer to the following Infoprint Server publications:

- *z/OS Infoprint Server Customization*
- *z/OS Infoprint Server Operation and Administration*
- *z/OS Infoprint Server User's Guide*
- *z/OS Infoprint Server Messages and Diagnosis*

Refer to the program directories for each Infoprint Server Transforms feature for installation information. The program directories are provided with the features and can be viewed on the Web at: `http://www.ibm.com/printers/`

Kanji AFP Print Feature

Description

The Infoprint Server Transforms product provides the Kanji AFP Print feature at no extra cost to Infoprint Server customers, The Kanji AFP Print feature can be used with the PDF to AFP and PostScript to AFP transforms. It lets you print PDF and PostScript data streams that contain double-byte character set (DBCS) fonts. The PDF to AFP and PostScript to AFP transforms map various DBCS fonts to the Japanese Heisei Kaku Gothic W5 and Heisei Mincho W3 fonts. These two Heisei fonts are provided with this feature.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	None.
Application Development	None.
Auditing	None.
Customization	None.
Diagnosis	None.
General User	A user can now print Japanese DBCS PDF and PostScript documents to IBM AFP printers.
Operations	None.
Interfaces	None.

Dependencies

You must order and install the Kanji AFP Print feature of Infoprint Server Transforms.

The PCL to AFP transform does *not* support printing double-byte character set data streams.

Migration Tasks

After you install this feature, no other tasks are required to use the Heisei fonts.

For More Information

The Infoprint Server publications do not contain any additional information about this function. Refer to the Kanji AFP Print Program Directory for installation information. The program directory is provided with the feature and can be viewed on the Web at: `http://www.ibm.com/printers/`

Transform Enhancements

Description

Infoprint Server Transforms now supports new environment variables and values in the transform configuration file, **aopxfd.conf**:

- The AOP_CUTSHEET variable controls whether or not the AFP to PCL, AFP to PostScript, and AFP to PDF transforms prepare documents for printing on cut-sheet printers as PSF does. By default, the transforms do not prepare documents for cut-sheet printers.

- The new AOP_FLATE variable controls whether or not the AFP to PDF transform compresses output. By default, the transform compresses output.

- The new AOP_PJL variable controls whether or not the AFP to PCL transform generates PJL commands. By default, the transform generates PJL commands.

- The existing AOP_PAPER variable now lets you specify the A5 paper size.

Also, the SAP to AFP transform now supports most SAP R/3 Release 4.6C OTF commands. The transform tolerates any Release 4.6C OTF commands that are not fully supported. This transform also provides enhanced support for bar codes, including support for customizing bar code widths and ratios.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	None.
Application Development	None.
Auditing	None.
Customization	The system programmer can specify new environment variables and values in the transform configuration file. For the SAP to AFP transform, the system programmer can now customize bar code width and ratio support.
Diagnosis	None.
General User	Anyone who uses the z/OS UNIX **sap2afp** command can now customize bar code width and ratio support.
Operations	None.
Interfaces	See Table 12 on page 111.

Dependencies

Apply the following PTFs if you want to use the new environment variables and values:

- PTF UW79806 for the AFP to PCL transform
- PTF UW79807 for the AFP to PostScript transform
- PTF UW79808 for the AFP to PDF transform

Apply the PTF for APAR OW50307 if you want to transform SAP R/3 Release 4.6C data streams.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply to only specified operating environments or to situations where there is more than one way to set up or enable the function. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
In the AFP to PCL, AFP to PDF, and AFP to PostScript entries in the transform configuration file: • Add the AOP_CUTSHEET variable if you want output prepared for cut-sheet printers. • Edit the AOP_PAPER variable if you use A5 paper.	Optional	*z/OS Infoprint Server Customization*
In the AFP to PDF entry in the transform configuration file, specify the AOP_FLATE variable if you want increased throughput instead of smaller PDF files.	Optional	*z/OS Infoprint Server Customization*
In the AFP to PCL entry in the transform configuration file, specify the AOP_PJL variable if your printer does not accept PJL commands.	Optional	*z/OS Infoprint Server Customization*
In the SAP to AFP **barcode.tab** configuration file, specify the new ModWidth and Ratio keywords to customize bar code support.	Optional	*z/OS Infoprint Server Customization*

For More Information

For more detailed information about this support, refer to *z/OS Infoprint Server Customization*.

Print Interface Remote Transforms

Description

Print Interface has added support for transforming data remotely on an AIX system that is running either Infoprint Manager for AIX or PSF for AIX. The following remote transforms are supported for transforming data to Advanced Function Presentation (AFP) format. IBM AFP printers can print data in AFP format.

- Printer Control Language (PCL) to AFP
- PostScript to AFP
- Portable Data Format (PDF) to AFP (supported only by Infoprint Manager for AIX)

Print Interface provides a new filter program to transform data remotely. Also, the new **filter-options** job attribute lets users specify transform options on the **lp** command and AOPPRINT JCL procedure.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	The administrator can specify the remote transform filter in the printer definitions for the target printers.
Application Development	None.
Auditing	None.
Customization	None.
Diagnosis	None.
General User	The user can specify transform filter options on the **lp** command and AOPPRINT JCL procedure.
Operations	None.
Interfaces	See Table 32 on page 135 and Table 36 on page 139.

Dependencies

Infoprint Manager for AIX V2R1 or higher or PSF for AIX V2R1 must be installed on the AIX system.

NetSpool and IP PrintWay do not provide remote transform support. Users must submit print jobs that require remote transforms to Print Interface.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only when the listed condition is met. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
Specify the remote transform filter in printer definitions.	Required	*z/OS Infoprint Server Operation and Administration*
Specify filter options on the **lp** command or the AOPPRINT JCL procedure.	Optional: For special printing needs	*z/OS Infoprint Server User's Guide*

For More Information

For more detailed information about this support, refer to the following Infoprint Server publications:

- *z/OS Infoprint Server Operation and Administration*
- *z/OS Infoprint Server User's Guide*

Print Interface IPP Server

Description

The Print Interface component of Infoprint Server provides a new Internet Printing Protocol (IPP) server. The IPP server accepts print requests from IPP clients, which typically run on workstation platforms. Print Interface processes the data and allocates an output data set on the JES spool.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	None.
Application Development	None.
Auditing	None.
Customization	The system programmer must customize the Print Interface IPP server.
Diagnosis	None.
General User	The user must customize the IPP client on the workstation.
Operations	The operator must start the IPP server.
Interfaces	See Table 12 on page 111, Table 14 on page 113, and Table 32 on page 135.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only when the listed condition is met. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
Customize the Print Interface IPP server.	Required	*z/OS Infoprint Server Customization*
Start the IPP server.	Required	*z/OS Infoprint Server Operation and Administration*
Customize the IPP client on the workstation.	Required	*z/OS Infoprint Server Customization* and *z/OS Infoprint Server User's Guide*

For More Information

For more detailed information about this support, refer to the following Infoprint Server publications:

- *z/OS Infoprint Server Customization*
- *z/OS Infoprint Server User's Guide*

Print Interface Dynamic Allocation Enhancements

Description

Enhanced dynamic allocation support in Print Interface lets the administrator specify additional JES output parameters in a printer definition. Print Interface and NetSpool use the same JES output parameters when they allocate data sets on the JES spool for the same printer.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	The administrator can specify additional JES output parameters in a printer definition or in an Allocation component.
Application Development	None.
Auditing	None.
Customization	None.
Diagnosis	None.
General User	None.
Operations	None.
Interfaces	None.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only when the listed condition is met. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
Add JES output parameters in printer definitions (or in Allocation components).	Required	*z/OS Infoprint Server Operation and Administration*

For More Information

For more detailed information about this support, refer to the following Infoprint Server publication:

- *z/OS Infoprint Server Operation and Administration*

Print Interface AOPPRINT JCL Procedure

Description

Print Interface provides the AOPPRINT JCL procedure so that users can submit batch jobs to print UNIX files and MVS data sets using the services of Print Interface. The user selects the target printer by simply specifying the name of the printer definition for the target printer on the AOPPRINT procedure; therefore, the user does not need to specify JES output parameters (such as CLASS or DEST). The user can, however, specify job attributes for special printing needs. Because Print Interface supports transforms, a user can use the AOPPRINT procedure to print PCL, PostScript, PDF, and SAP files to IBM AFP printers.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	None.
Application Development	The application developer can use AOPPRINT.
Auditing	None.
Customization	The system programmer can customize the AOPPRINT procedure.
Diagnosis	None.
General User	To use the AOPPRINT procedure users must know the name of the printer definition and be familiar with job attributes.
Operations	None.
Interfaces	See Table 32 on page 135.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only when the listed condition is met. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
Customize the AOPPRINT procedure.	Optional: If files and libraries are not in default locations	*z/OS Infoprint Server Customization*
Use the AOPPRINT procedure to print files.	Required	*z/OS Infoprint Server User's Guide*

For More Information

For more detailed information about this support, refer to the following Infoprint Server publications:
* *z/OS Infoprint Server Customization*
* *z/OS Infoprint Server User's Guide*

Print Interface Ip Command Enhancements

Description

The **lp** command has the following enhancements:

- The **shift-out-shift-in** attribute now accepts value **three**.
- The following job attributes are now allowed for IP PrintWay printers because IP PrintWay can pass these attributes to Infoprint Manager for AIX: **chars**, **form-definition**, **page-definition**, **print-error-reporting**, and **table-reference-characters**.
- The **input-tray** and **output-bin** attributes now accept any names defined by the administrator in the printer definition; in previous releases, the **lp** command accepted only pre-defined names.
- The new **address-text** attribute can be used instead of the **address1-text**, **address2-text**, **address3-text**, and **address4-text** attributes, which are still supported but no longer documented.
- The **chars** and **resource-library** attributes now require that a set of font names and resource library names be enclosed in braces instead of in single or double quotation marks.
- A new environment variable, AOPOPTIONS, lets users specify commonly-used job attributes for the **lp** command.

Print Interface also provides comparable support for the administrator:

- The administrator can now specify value **three** in the **PRMODE** field of a printer definition.
- The administrator can now specify character sets, a form definition name, a page definition name, the type of print-error reporting, and table reference characters in an IP PrintWay printer definition.
- The administrator can now specify any input tray and output bin names in the printer definition.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	The administrator can now specify tray and bin names in a printer definition.
Application Development	Shell scripts that use the **lp** command might need modification. See General User area.
Auditing	None.
Customization	None.
Diagnosis	None.
General User	A user now must enclose values in the **chars** or **resource-library** attributes on the **lp** command in braces. **lp** command or AOPPRINT users can use the AOPOPTIONS environment variable to simplify specification of job attributes.
Operations	None.
Interfaces	See Table 36 on page 139.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only when the listed condition is met. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
Review shell scripts and **lp** command attribute files. Recode **chars** and **resource-library** attributes to use braces.	Optional: If you use shell scripts or attribute files.	*z/OS Infoprint Server User's Guide*
Use enhanced job attributes and AOPOPTIONS environment variable.	Optional: To specify attributes for a particular job.	*z/OS Infoprint Server User's Guide*
Specify new printer attributes in printer definitions.	Optional: To specify default attributes for all jobs	*z/OS Infoprint Server Operation and Administration*

For More Information

For more detailed information about this support, refer to the following Infoprint Server publications:

- *z/OS Infoprint Server User's Guide*
- *z/OS Infoprint Server Operation and Administration*

Print Interface Job Status Enhancements

Description

The z/OS UNIX **lpstat** command can now recognize the following additional states:

- IP PrintWay successfully transmitted the data set to the remote printer.
- IP PrintWay failed to transmit the data set to the remote printer.
- PSF for OS/390 completed printing a data set.
- PSF for OS/390 failed to print the data set.
- A data set was purged from the JES spool before it was printed by PSF for OS/390 or transmitted to a remote printer.

z/OS UNIX users now receive notification of job completion immediately without the delays that could be experienced in previous releases. Also, notification occurs as soon as IP PrintWay has finished transmitting the data set to the remote printer or has exhausted all retry attempts, even if the data set is retained on the JES spool at the request of the administrator or because an error occurred.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	None.
Application Development	None.
Auditing	None.
Customization	None.
Diagnosis	None.
General User	The **lpstat** command reports more accurate status. z/OS UNIX users can receive more timely notification of job completion and the final state of the print job.
Operations	None.
Interfaces	See Table 36 on page 139.

Migration Tasks

None.

For More Information

For more detailed information about this support, refer to the following Infoprint Server publication:

- *z/OS Infoprint Server User's Guide*

Print Interface SMB Protocol Support

Description

Print Interface, in conjunction with the z/OS Server Message Block (SMB) server, now lets users print on z/OS printers from workstation clients that support the SMB printing protocol. Users can submit print jobs and query the status of print jobs. No support is provided for canceling print jobs.

The z/OS SMB server is part of the z/OS Distributed File Service element. Workstations that support SMB protocol include Windows 2000, Windows 98, Windows 95, Windows NT 4.0, and Windows 3.11.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	None.
Application Development	None.
Auditing	None.
Customization	None.
Diagnosis	None.
General User	The user must define the z/OS printer to the workstation.
Operations	None.
Interfaces	None.

Dependencies

To submit a print job using SMB protocol, you do not need to install the Infoprint Port Monitor for Windows. However, some users might want to use the Port Monitor for better z/OS system performance and to take advantage of the enhancements described in "Infoprint Port Monitor for Windows Enhancements" on page 78. Refer to *z/OS Infoprint Server Customization* for a comparison of the functions available when you use SMB protocol versus the Infoprint Port Monitor for Windows.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only when the listed condition is met. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
Customize the z/OS SMB server and define each printer to the z/OS SMB server. Start the z/OS SMB server.	Required	*z/OS Distributed File Service SMB Administration*
Define the z/OS printer to the Windows workstation.	Required	*z/OS Distributed File Service SMB Administration*

Task	Condition	Reference Information
Customize Print Interface	Required unless Print Interface is already customized	*z/OS Infoprint Server Customization*
Define each printer in the Printer Inventory	Required	*z/OS Infoprint Server Operation and Administration*

For More Information

For more detailed information about this support, refer to the following Infoprint Server and Distributed File Service publications:

- *z/OS Infoprint Server Customization*
- *z/OS Distributed File Service SMB Administration*

Infoprint Port Monitor for Windows Enhancements

Description

The OS/390 V2R8 version of the Infoprint Port Monitor for Windows, which runs on Windows 95/ 98, Windows NT, and Windows 2000, lets users specify distribution information that can be printed on the separator page, such as name and department. Users can also specify other job attributes supported by Infoprint Server and described in *z/OS Infoprint Server User's Guide*.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	None.
Application Development	None.
Auditing	None.
Customization	None.
Diagnosis	None.
General User	The user can optionally specify job attributes when customizing the Infoprint Port Monitor for Windows or when printing a document.
Operations	None.
Interfaces	See "Infoprint Port Monitor for Windows" on page 124.

Dependencies

Windows users can continue to use the previous version of the Infoprint Port Monitor for Windows if they do not need to use the enhancements.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only when the listed condition is met. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
Uninstall the previous version of the Infoprint Port Monitor for Windows.	Optional: If you have installed a previous version.	`http://www.ibm.com/printers/` or *z/OS Infoprint Server User's Guide*
Download, install, and customize the latest version of the Infoprint Port Monitor for Windows.	Required	`http://www.ibm.com/printers/` or *z/OS Infoprint Server User's Guide*

For More Information

For more detailed information about this support, refer to *z/OS Infoprint Server User's Guide*.

Print Interface Filter Enhancements

Description

Print Interface now lets an installation write a UNIX-style filter program to modify data before Print Interface writes the data to the JES spool. A UNIX filter can be a shell executable such as a C program, a REXX exec, a shell script, and so on. In previous releases, Print Interface supported only DLL-style filters. Both UNIX filters and DLL filters can now request that Print Interface pass specific job attributes to the filter; job attributes are described in *z/OS Infoprint Server User's Guide*. In addition, DLL filters can now set job attributes.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	None.
Application Development	None.
Auditing	None.
Customization	The system programmer can write a filter to use the enhancements.
Diagnosis	None.
General User	None.
Operations	None.
Interfaces	"Filters" on page 122

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only when the listed condition is met. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
Enhance filters to use new functions. You do *not* need to recompile existing filters.	Required	*z/OS Infoprint Server Customization*

For More Information

For more detailed information about this support, refer to the following Infoprint Server publication:

- *z/OS Infoprint Server Customization*

Print Interface API

Description

The Print Interface component of Infoprint Server provides an application programming interface (API), which lets you write C or C++ applicatons to perform the following functions:

- Create and cancel a print job on the z/OS JES spool
- Query the status of a print job and the status of all jobs for a printer
- Query information about printers defined in the Printer Inventory
- Connect a transform to the Transform Manager

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	The administrator must create a printer definition for the target printer if one does not exist.
Application Development	The application programmer uses the functions provided in the API to create jobs and query job status.
Auditing	None.
Customization	The system programmer must customize the Print Interface component if it has not been customized.
Diagnosis	None.
General User	None.
Operations	None.
Interfaces	See "Application Programming Interface (API) Functions" on page 110 and "/usr/lpp/Printsrv/samples/ Directory" on page 138.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only when the listed condition is met. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
Use the API functions.	Required	*z/OS Infoprint Server Customization*
Customize Print Interface	Optional: If not already customized.	*z/OS Infoprint Server Customization*

For More Information

For detailed information about this support, refer to the following publication:

- *z/OS Infoprint Server Customization*

Print Interface SAP Output Management System

Description

The Print Interface SAP R/3 Output Management System (OMS), in conjunction with the SAP R/3 Application Server for z/OS, lets SAP R/3 users print on any printer defined in the Printer Inventory, cancel jobs, obtain accurate job status, and receive immediate notification when their documents have completed (successfully or unsuccessfully).

Infoprint Server is now SAP-certified as interface software for the SAP R/3 4.0 system.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	The SAP administrator must define an Infoprint Server ROMS and LOMS to SAP R/3 and create SAP output devices.
Application Development	None.
Auditing	None.
Customization	The system programmer must customize the Print Interface SAP OMS.
Diagnosis	None.
General User	None
Operations	The operator must restart Infoprint Server after customization of the Print Interface SAP OMS.
Interfaces	See "Configuration Files" on page 111, "Environment Variables" on page 113, "File Systems — /etc and /var Directories" on page 122, and"/usr/lpp/Printsrv/samples/ Directory" on page 138

Dependencies

To use the SAP OMS, the SAP R/3 Application Server for z/OS, an SAP product, is required. The SAP R/3 Application Server for z/OS spool work process must run on the same z/OS system as Infoprint Server.

To print to IBM AFP printers on the z/OS system, the following software products are required:
- Infoprint Server Transforms. The Transforms to AFP feature provides the SAP to AFP transform at no extra cost to Infoprint Server customers.
- PSF V3R1.0 for OS/390 (5655-B17), or later.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only when the listed condition is met. For more details on the procedures associated with a task, see the reference listed.

Print Interface SAP OMS

Task	Condition	Reference Information
Define an SAP user for the Callback daemon	Required	*z/OS Infoprint Server Customization*
Create the SAP Callback daemon configuration file, **aopsapd.conf**.	Required	*z/OS Infoprint Server Customization*
Define an Infoprint Server ROMS and LOMS to the SAP R/3 Application Server for z/OS.	Required	*z/OS Infoprint Server Customization*
Create SAP output devices	Required	*z/OS Infoprint Server Customization*
Customize the SAP to AFP transform.	Optional: To print SAP OTF or ABAP data to IBM AFP printers	*z/OS Infoprint Server Customization*

For More Information

For more detailed information about this support, refer to the following Infoprint Server publication:

- *z/OS Infoprint Server Customization*

Print Interface LPD Compatibility Filter

Description

Print Interface now provides an LPD compatibility filter, **lpd_compat.so**. This filter provides function that is similar to the function provided by the z/OS Communications Server (TCP/IP) LPD. For example, when you use filter **lpd_compat.so**, the Print Interface LPD provides support for:

- Printing a header with a page number on each page.
- Limiting the number of lines per page and the number of characters per line.

The LPD compatibility filter also lets you specify filter options, which provide equivalent support to the following z/OS TCP/IP options:

- LPR command options: FILTER, LINECOUNT, and WIDTH.
- LPD options on SERVICE statement: PAGESIZE and LINESIZE.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	The administrator can specify filter **lpd_compat.so** in the printer definition. The administrator can also specify default values for the type of filter processing, the maximum line length, and the maximum number of lines per page
Application Development	None.
Auditing	None.
Customization	None.
Diagnosis	None.
General User	A user can specify the type of filter processing, the maximum line length, and the maximum number of lines per page in the Infoprint Server **filter-options** job attribute, for example, on the **lp** command.
Operations	None.
Interfaces	See Table 17 on page 123.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only when the listed condition is met. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
Specify the **lpd_compat.so** filter and options in the printer definition.	Required	*z/OS Infoprint Server Operation and Administration*
Specify filter options in the **filter-options** job attribute.	Optional: To specify the type of filtering, maximum lines per page, or maximum line width.	*z/OS Infoprint Server User's Guide*

Print Interface LPD Compatibility Filter

For More Information

For more detailed information about this support, refer to the following Infoprint Server publications:

- *z/OS Infoprint Server Operation and Administration*
- *z/OS Infoprint Server User's Guide*

NetSpool Operator Command Enhancements

Description

NetSpool operator commands have the following enhancements:

- The operator must now use the MODIFY command (an MVS command) to direct NetSpool operator commands to NetSpool. The operator can no longer reply to an outstanding NetSpool WTOR message. In previous releases, an installation could choose which method to use.
- The DISPLAY command has these enhancements:
  - The LUNAME option displays the status of a printer logical unit (LU).
  - The TRACE option shows printer LUs being traced. (Trace information is no longer displayed for other DISPLAY options.)
  - A new state, PENDING CLOSE, is possible.
  - The ALL and NOTSEL options are no longer supported.
- The PURGE command is new. It can stop a session with a NetSpool printer LU immediately.

Note: See "Printer Inventory" on page 53 for other changes to NetSpool operator commands due to the Printer Inventory enhancement.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	None.
Application Development	None.
Auditing	None.
Customization	None.
Diagnosis	None.
General User	None.
Operations	The operator must use the MODIFY command to enter NetSpool commands. The operator must use Infoprint Server ISPF panels to display all printers defined to NetSpool instead of the DISPLAY command.
Interfaces	See Table 25 on page 131.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to *all* installations that run NetSpool. **Optional** tasks apply only when the listed condition is met. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
Remove the WTOR parameter from the NetSpool startup procedure.	Required	*z/OS Infoprint Server Customization*

NetSpool Operator Command Enhancements

Task	Condition	Reference Information
Use the MODIFY command to enter NetSpool commands; change use of DISPLAY command; use PURGE command for error situations.	Required	*z/OS Infoprint Server Operation and Administration*

For More Information

For more detailed information about this support, refer to the following Infoprint Server publications:

- *z/OS Infoprint Server Operation and Administration*
- *z/OS Infoprint Server Customization*

NetSpool Dynamic Allocation Enhancement

Description

New dynamic allocation support in NetSpool lets the administrator specify JES output parameters directly in the printer definition instead of on OUTPUT JCL statements in the NetSpool startup procedure. NetSpool uses these JES output parameters to dynamically allocate an output data set on the JES spool.

The migration program converts each OUTPUT JCL statement in existing NetSpool startup procedures to an Allocation component and includes the Allocation component in the new printer definition for the target printer. Therefore, if you use the migration program, no additional migration tasks are required to take advantage of this enhancement.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	The administrator can now specify JES output parameters in each printer definition; if several printer definitions use the same output parameters, the administrator might want to create an Allocation component and include that component in the printer definitions.
Application Development	None.
Auditing	None.
Customization	NetSpool ignores OUTPUT JCL statements in the NetSpool startup procedure.
Diagnosis	None.
General User	None.
Operations	The operator no longer needs to restart NetSpool for NetSpool to pick up changes to JES output parameters specified in the NetSpool startup procedure. NetSpool can automatically pick up changes made to JES output parameters specified in printer definitions.
Interfaces	See Table 32 on page 135 and Table 27 on page 133.

Migration Tasks

The following migration tasks are associated with this enhancement. A **required** task must be performed regardless of whether you implement this function at your installation. An **optional** task must be performed only if the condition is met.

Task	Condition	Reference Information
Specify JES allocation parameters in printer definitions.	Optional: To specify additional OUTPUT parameters	*z/OS Infoprint Server Operation and Administration*

For More Information

For more detailed information about this support, refer to the following Infoprint Server publication:

- *z/OS Infoprint Server Operation and Administration*

IP PrintWay Startup Enhancements

Description

If your installation wants to specify IP PrintWay customization information (such as the number of hiperspace blocks, the language for IP PrintWay messages, and the type of tracing), the administrator must now specify this information in the Printer Inventory instead of in the IP PrintWay startup procedure. To specify customization information, the administrator creates functional subsystem (FSS) and functional subsystem application (FSA) definitions in the Printer Inventory. IP PrintWay uses the information in the FSS and FSA definitions when the IP PrintWay FSS and FSAs start.

IP PrintWay has also added support to let the administrator specify a different level of tracing for each IP PrintWay FSA in the FSA definition; by default, the tracing specified in the FSS definition applies to each FSA. To change the type of tracing for the FSA, the FSS must be restarted.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	To specify IP PrintWay customization information, the administrator now creates FSS and FSA definitions in the Printer Inventory. These definitions are optional; IP PrintWay uses default values if these definitions do not exist.
Application Development	None.
Auditing	None.
Customization	Parameters and PRINTDEV JCL statements in IP PrintWay startup procedures are ignored.
Diagnosis	Tracing parameters are now specified in IP PrintWay FSS and FSA definitions in the Printer Inventory. The administrator can specify a different level of tracing for each IP PrintWay FSA.
General User	None.
Operations	None.
Interfaces	See Table 20 on page 124 and Table 28 on page 134.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only when the listed condition is met. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
Create IP PrintWay FSS definitions in the Printer Inventory.	Optional: If default configuration is not suitable	*z/OS Infoprint Server Customization*
Remove unsupported EXEC statement parameters and PRINTDEV statements from the IP PrintWay startup procedure.	Optional: If not removed, statements are ignored.	*z/OS Infoprint Server Customization*

For More Information

For more detailed information about this support, refer to the following Infoprint Server publications:

- *z/OS Infoprint Server Customization*
- *z/OS Infoprint Server Operation and Administration*

IP PrintWay IPP Client

Description

IP PrintWay now provides an Internet Printing Protocol (IPP) client. The IP PrintWay IPP client transmits output data sets from the JES spool over the Internet to IPP servers running either in a printer or on another host system. The IP PrintWay IPP client transmits IPP job attributes to the IPP printer.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	The administrator must create a printer definition for the target printer and specify the Universal Resource Location (URL) of the printer.
Application Development	None.
Auditing	The SMF record contains the URL of the IPP printer in the same field as the IP address.
Customization	IP PrintWay exits must be able to accept the URL and IP address in the same input field. The IP PrintWay routing exit can now specify a URL when rerouting a data set.
Diagnosis	None.
General User	None.
Operations	IP PrintWay displays the URL of the target printer in the ISPF transmission-queue panels.
Interfaces	See Table 15 on page 113 and Table 27 on page 133.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only when the listed condition is met. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
Add the STDENV DD statement to the IP PrintWay startup procedure.	Optional: If you did not install Infoprint Server files in the default directories.	*z/OS Infoprint Server Customization*
Review IP PrintWay exits to determine if they can accept a URL instead of an IP address in the same input field.	Optional: If you use IP PrintWay exits	*z/OS Infoprint Server Customization*
Create a printer definition for each printer and specify the URL of the printer.	Required	*z/OS Infoprint Server Operation and Administration*

For More Information

For more detailed information about this support, refer to the following Infoprint Server publications:

- *z/OS Infoprint Server Customization*
- *z/OS Infoprint Server Operation and Administration*

IP PrintWay Printer Selection with FSSDATA JCL Parameter

Description

IP PrintWay now lets users select a printer definition by specifying the name of the definition in the FSSDATA parameter of an OUTPUT JCL statement. Because users can select a printer definition by name, administrators no longer need to specify DEST, CLASS, and FORMS routing criteria in a printer definition. Administrators and users can, however, continue to use DEST, CLASS, and FORMS routing criteria if desired. See "IP PrintWay Extended Routing Criteria" on page 94 for information about a related enhancement.

When the FSSDATA parameter is specified, users can also specify the DEST=IP, PRTQUEUE, and PORTNO parameters on the OUTPUT JCL statement to override the IP address, print queue name, and port number in the selected printer definition. This support means that users can use the FSSDATA parameter to select a printer definition with the desired IP PrintWay options, but print to printers whose IP addresses are not defined in the Printer Inventory.

Note: Although users no longer need to specify DEST, CLASS, and FORMS routing criteria to select a printer definition, users must continue to specify the JES work-selection criteria defined to JES for the IP PrintWay FSA.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	Specifying DEST, CLASS, and FORMS for printer selection is now optional in a printer definition.
Application Development	None.
Auditing	None.
Customization	IP PrintWay exits must be able to accept either the printer definition name or the DEST, CLASS, and FORMS values in the same input field. Because NetSpool and Print Interface now use the FSSDATA output parameter when they allocate data sets on the JES spool, the printer definition name (instead of the DEST, CLASS, and FORMS values) is input to IP PrintWay exits.
Diagnosis	None.
General User	Users can now select IP PrintWay printers by specifying the FSSDATA=printer parameter on an OUTPUT JCL statement, and users can override the IP address and print queue name or port number in the selected printer definition.
Operations	The new **Route Name** field on the ISPF transmission-queue ISPF panels displays the printer definition name or the DEST, CLASS, and FORMS values.
Interfaces	See Table 15 on page 113 and Table 21 on page 126.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only when the listed condition is met. For more details on the procedures associated

with a task, see the reference listed.

Task	Condition	Reference Information
Code the FSSDATA parameter on OUTPUT statements.	Required	*z/OS Infoprint Server User's Guide*
Review exits to see whether they inspect or modify the DEST, CLASS, and FORMS routing key. Recode exits if necessary to accept the printer name in the same field.	Optional: If you use IP PrintWay exits and your installation either (1) uses the FSSDATA parameter on OUTPUT JCL statements or (2) runs NetSpool or Print Interface.	*z/OS Infoprint Server Customization*

For More Information

For more detailed information about this support, refer to the following Infoprint Server publications:

- *z/OS Infoprint Server Customization*
- *z/OS Infoprint Server User's Guide*

IP PrintWay Extended Routing Criteria

Description

Prior to OS/390 V2R8, the administrator was required to specify values for the DEST, CLASS, *and* FORMS routing criteria in each IP PrintWay routing entry. IP PrintWay selected the routing entry only if the values for all three routing criteria on an OUTPUT JCL statement matched the values specified in the routing entry. This requirement meant that administrators were sometimes forced to create several routing entries for the same target printer.

Starting with OS/390 V2R8, the administrator can omit one or more of the DEST, CLASS, and FORMS values in a printer definition; if a value is omitted, IP PrintWay does not use the value in that parameter when selecting the printer definition.

To take advantage of this enhancement, the migration program merges multiple IP PrintWay routing entries for the same target printer into one printer definition whenever possible by omitting one or more of the DEST, CLASS, and FORMS parameters in the printer definition. The migration program does so only if all of the merged routing entries have the same contents. When you run the migration program, you can suppress this function of the migration program. See "Options" on page 144 for a description of the **-s** option, and see section "Merge IP Routing Criteria" in Appendix A, "Migration Report" on page 159 for a more detailed description of how the migration program merges routing criteria.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	The administrator can omit the DEST, CLASS, or FORMS value when specifying printer-selection criteria in a printer definition; if a value is omitted, IP PrintWay ignores the value in that JCL parameter when selecting the printer definition.
Application Development	None.
Auditing	None.
Customization	The XTPDEST, XTPCLASS, and XTPFORMS fields, which are input to some IP PrintWay exits, contain blanks if the DEST, CLASS, or FORMS field is omitted in the printer definition.
Diagnosis	None.
General User	None.
Operations	The **Route Name** field on the transmission-queue ISPF panel displays the DEST, CLASS, and FORMS values that IP PrintWay used to select the printer definition. If IP PrintWay did not use one of these values to select the printer definition, the value is blank.
Interfaces	See Table 15 on page 113 and Table 21 on page 126.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only when the listed condition is met. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
Specify DEST, CLASS, and FORMS for printer selection in a printer definition.	Required	*z/OS Infoprint Server Operation and Administration*
Review exits to see whether the exits can accept blanks in the XTPDEST, XTPCLASS, and XTPFORMS fields. Recode exits if necessary.	Optional: If you use IP PrintWay exits	*z/OS Infoprint Server Customization*

For More Information

For more detailed information about this support, refer to the following Infoprint Server publications:

- *z/OS Infoprint Server Customization*
- *z/OS Infoprint Server Operation and Administration*

IP PrintWay Code Page Conversion

Description

Starting with OS/390 V2R8, IP PrintWay uses the **iconv** utility, by default, to convert data from EBCDIC to ASCII. The **iconv** utility uses source (document) and target (printer) code pages to convert data.

For compatibility with previous releases, IP PrintWay continues to provide support for DBCS and customized TCP/IP EBCDIC to ASCII translation tables. Also, the administrator can request that IP PrintWay, by default, continue to use the standard TCP/IP EBCDIC to ASCII translation table.

To take advantage of this enhancement, the migration program specifies an ASCII code page as the target (printer) code page in IP PrintWay printer definitions that do not specify DBCS or customized translate tables. You can specify the ASCII code page for the migration program to use in the Infoprint Server configuration file. See "Usage Notes" on page 148 for more information.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	The administrator can now specify document and printer code pages in printer definitions. In the IP PrintWay FSS definition, the administrator can (1) specify a default source (document) code page and (2) request that IP PrintWay use the standard TCP/IP translation table by default.
Application Development	None.
Auditing	None.
Customization	None.
Diagnosis	None.
General User	If the **iconv** utility is used, the user might see some differences in output.
Operations	None.
Interfaces	See Table 20 on page 124.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only when the listed condition is met. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
Specify document and printer code pages in printer definitions. Specify a default document code page in the IP PrintWay FSS definition.	Optional: To use non-default code pages	*z/OS Infoprint Server Operation and Administration*

Task	Condition	Reference Information
Select the **Old style translation** field in the IP PrintWay FSS definition.	Optional: To use standard TCP/IP translate table by default	*z/OS Infoprint Server Operation and Administration*

Note: If you use the Infoprint Server migration program to convert IP PrintWay options entries, and you want IP PrintWay to continue to use the standard TCP/IP translate table by default, you must edit the Printer Inventory entries created by the migration program. See "Viewing and Editing the Printer Inventory" on page 155 for more information.

For More Information

For more detailed information about this support, refer to the following Infoprint Server publication:

- *z/OS Infoprint Server Operation and Administration*

IP PrintWay Printer Instruction Enhancements

Description

In previous releases, the administrator could specify printer instructions for IP PrintWay to send to the printer at the *beginning* of the data. (Printer instructions were called "printer setup parameters" in previous releases.) Starting with OS/390 V2R8, IP PrintWay lets the administrator also specify printer instructions for IP PrintWay to send to the printer at the *end* of the data. This support lets you return the printer to the state that existed before printing of the document.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	The administrator can now specify instructions for IP PrintWay to send to the printer at the end of a data set. The instructions can be in either EBCDIC or ASCII representation.
Application Development	None.
Auditing	None.
Customization	None.
Diagnosis	None.
General User	None.
Operations	None.
Interfaces	See Table 20 on page 124.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only when the listed condition is met. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
Specify printer instructions in the **Document trailer** field of a printer definition.	Required	*z/OS Infoprint Server Operation and Administration*

For More Information

For more detailed information about this support, refer to the following Infoprint Server publication:

• *z/OS Infoprint Server Operation and Administration*

IP PrintWay Coordination with Print Interface and NetSpool

Description

When IP PrintWay selects an output data set from the JES spool, IP PrintWay can now determine whether Print Interface or NetSpool allocated that data set on the spool. IP PrintWay can tailor its processing accordingly.

If Print Interface allocated the data set, IP PrintWay does not format or convert the data to ASCII. This is because Print Interface has already converted data from EBCDIC to ASCII. This enhancement eliminates the need for the administrator to select the **None** option in the IP PrintWay **Formatting** field in a printer definition for Print Interface data sets. (The **None** option is the old IP PrintWay BINARY LPR option in IP PrintWay ISPF panels.)

If NetSpool allocated the data set, IP PrintWay transmits the data set to the printer immediately and does not try to group the other data sets in the job together. This is because all data sets allocated by NetSpool appear to be in the same job. This enhancement eliminates the need for the administrator to select the **None** option in the **Dataset Grouping** field in the Infoprint Server ISPF panels for NetSpool data sets. (The **Dataset Grouping** field is the old **Trans Group** field in IP PrintWay ISPF panels.)

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	The administrator no longer needs to specify an IP PrintWay formatting option for data sets allocated on the JES spool by Print Interface.
	The administrator no longer needs to specify the type of data set grouping required by NetSpool.
Application Development	None.
Auditing	None.
Customization	None.
Diagnosis	None.
General User	None.
Operations	None.
Interfaces	See Table 20 on page 124.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only when the listed condition is met. For more details on the procedures associated with a task, see the reference listed.

IP PrintWay Coordination with Print Interface and NetSpool

Task	Condition	Reference Information
Understand how to specify the IP PrintWay **Formatting** field in a printer definition.	Optional: If you use Print Interface and want to change default formatting.	*z/OS Infoprint Server Operation and Administration*
Understand how to specify the **Dataset grouping** field in a printer definition.	Optional: If you use NetSpool and want to change default formatting.	*z/OS Infoprint Server Operation and Administration*

For More Information

For more detailed information about this support, refer to the following Infoprint Server publication:

- *z/OS Infoprint Server Operation and Administration*

IP PrintWay Restrict Ports

Description

Prior to OS/390 V2R8, the IP PrintWay LPR, by default, restricted itself to OS/390 ports 721 through 731. The administrator could specify the USERPORTS LPR option to cause the IP PrintWay LPR to use any available port.

In OS/390 V2R8, to increase the probability of finding a free port, the IP PrintWay LPR, by default, uses any available port. The administrator can select the **Restrict ports** field in the printer definition to cause the IP PrintWay LPR to restrict itself to ports 721 through 731. The LPDs on some platforms, such as AIX, require that the IP PrintWay LPR restrict itself to these ports.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	The administrator must select the **Restrict ports** field in the printer definition to restrict ports to between 721 to 731.
Application Development	None.
Auditing	None.
Customization	None.
Diagnosis	None.
General User	None.
Operations	None.
Interfaces	See Table 20 on page 124.

Migration Tasks

If you use the Infoprint Server migration program, no additional migration tasks are necessary. The migration program sets the **Restrict port** field in all IP PrintWay printer definitions so that IP PrintWay port-selection behavior for these printers remains the same as in previous releases.

For More Information

For more detailed information about this support, refer to the following Infoprint Server publication:

- *z/OS Infoprint Server Operation and Administration*

IP PrintWay Transform Function

Description

The IP PrintWay transform function (also called the *Resubmit for filtering* function) lets you use data transforms provided by Infoprint Server Transforms to transform data sets submitted directly to IP PrintWay. This means that you can now transform data sets allocated by a z/OS batch application, a TSO/E application, or NetSpool. Previously, you could only transform data sets that were submitted directly to Print Interface, for example, from a remote system or with the **lp** command or AOPPRINT JCL proecedure.

This function lets you use any transform provided by Infoprint Server Transforms. For example, you can use the following transforms:

- AFP to PCL transform, which lets you print AFP documents to PCL printers
- AFP to PostScript transform, which lets you print AFP documents to PostScript printers
- AFP to PDF transform, which lets you create PDF output for viewing and printing from a workstation.

These transforms can also format line data with a page definition and convert it to PCL, PostScript, or PDF format. See "AFP to PCL, AFP to PDF, and AFP to PostScript Transforms" on page 62 for more information about these transforms.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	The administrator can enable this function and specify a transform filter in the printer definition for the target printer.
Application Development	None.
Auditing	When this function is enabled in the printer definition, IP PrintWay writes two SMF records for a data set. IP PrintWay writes the first SMF record when transmitting the data set to the Print Interface LPD so that the transform can be performed; this record contains the IP address of the z/OS system. IP PrintWay writes a second SMF record when transmitting the data set to the target printer; this record contains the IP address of the target system.
Customization	The system programmer must customize the Print Interface LPD. The system programmer can write an IP PrintWay SMF exit to suppress the first SMF record written for a data set; see "Auditing" for more information.
Diagnosis	None.
General User	The user can use standard MVS JCL parameters to print AFP or line data to a PCL or PostScript printer.
Operations	The operator must start the Print Interface LPD.
Interfaces	See "Exits" on page 113, "Infoprint Server ISPF Panels" on page 124, and "JCL Parameters on OUTPUT and DD Statements" on page 126.

Dependencies

To use this function, Infoprint Server Transforms is required.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only when the listed condition is met. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
Select the **Resubmit for filtering** field and specify a transform filter in the printer definition.	Required	*z/OS Infoprint Server Operation and Administration*
Customize the Print Interface LPD; the LPD must listen at port 515.	Optional: If the LPD is not already customized.	*z/OS Infoprint Server Customization*
Start the Print Interface LPD.	Optional: If the LPD is not already started.	*z/OS Infoprint Server Operation and Administration*
Write an IP PrintWay SMF exit to suppress the first SMF record written for a data set.	Optional: If your accounting procedures require that one of the SMF records be suppressed.	*z/OS Infoprint Server Customization*
Specify JCL parameters used by these transforms on OUTPUT JCL statements.	Optional: To specify AFP parameters not specifed in the printer definition.	*z/OS Infoprint Server User's Guide*

For More Information

For more detailed information about this support, refer to the following Infoprint Server publications:

- *z/OS Infoprint Server Introduction*
- *z/OS Infoprint Server Customization*
- *z/OS Infoprint Server Operation and Administration*
- *z/OS Infoprint Server User's Guide*

IP PrintWay VTAM Printer Support

Description

IP PrintWay now contains support for printing line-data documents from the JES spool to VTAM-controlled printers defined as VTAM LU type 0, LU type 1, or LU type 3 printers. Supported output data streams are SNA Character String (SCS) and Data Stream Compatible/Data Stream Extended (DSC/DSE).

You can use batch applications to print line data documents to VTAM-controlled printers. Also, you can use Print Interface to print text or line data.

Note: The term VTAM refers to the Communications Server SNA Services element of z/OS.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	The administrator must create a printer definition for each printer and also define each printer to VTAM if it is not already defined.
Application Development	None.
Auditing	None.
Customization	A VTAM APPL statement is required for each IP PrintWay FSS. Also, an FSS definition in the Printer Inventory is required for each IP PrintWay FSS. IP PrintWay exits must be able to accept the VTAM LU name and IP address in the same input field. The IP PrintWay routing exit can now specify a VTAM LU name when rerouting a data set.
Diagnosis	None
General User	None.
Operations	IP PrintWay displays the VTAM LU name of the target printer in the transmission-queue panels.
Interfaces	See Table 15 on page 113.

Dependencies

To use this function, the Coax Printer Support feature of Infoprint Server Transforms is required.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only when the listed condition is met. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
Define a VTAM application program (APPL statement) for each IP PrintWay FSS.	Required	*z/OS Infoprint Server Customization*

Task	Condition	Reference Information
Specify the APPL IDs in IP PrintWay FSS definitions in the Printer Inventory.	Required	*z/OS Infoprint Server Customization*
Review IP PrintWay exits to determine if they can accept a VTAM LU name instead of an IP address in the same input field.	Optional: If you use IP PrintWay exits	*z/OS Infoprint Server Customization*
Restart the IP PrintWay FSSs.	Required	*z/OS Infoprint Server Operation and Administration*
Create a printer definition in the Printer Inventory for each VTAM-controlled printer.	Required	*z/OS Infoprint Server Operation and Administration*
Define each printer to VTAM.	Optional: If the printer is not already defined to VTAM	*z/OS Infoprint Server Operation and Administration*

For More Information

For more detailed information about this support, refer to the following Infoprint Server publications:

- *z/OS Infoprint Server Customization*
- *z/OS Infoprint Server Operation and Administration*

SNMP Subagent

Description

A new Infoprint Server component, the Simple Network Management Protocol (SNMP) subagent, provides support that lets administrators view printer characteristics and printer status for any printer controlled by PSF for OS/390. Also, administrators can be notified as soon as an intervention situation occurs on PSF-controlled printers.

What This Change Affects

This support affects the following areas of Infoprint Server processing.

Area	Considerations
Administration	The administrator can request SNMP reporting in the FSA definition in the Printer Inventory for a PSF printer. By default, SNMP reporting is not enabled.
Application Development	None.
Auditing	None
Customization	The system programmer must customize the Infoprint Server SNMP subagent. See "Dependencies" for more information. The system programmer can, optionally, automate the start of the SNMP subagent.
Diagnosis	The diagnostician might need to trace the z/OS SNMP agent or PSF for OS/390 to help IBM diagnose errors.
General User	None.
Operations	The operator must start the z/OS SNMP agent and then start the Infoprint Server SNMP subagent unless your installation has automated the start of the subagent.
Interfaces	See Table 12 on page 111 and Table 36 on page 139.

Dependencies

To use the Infoprint Server SNMP subagent, your installation must also do the following:

- Customize and start the z/OS SNMP agent before starting the subagent.
- Install and customize an SNMP manager that supports the printer MIB and multiple printers defined with one IP address.
- Customize PSF for OS/390 to use the Printer Inventory and enable SNMP reporting in FSA definitions for PSF printers.

Migration Tasks

The following migration tasks are associated with this enhancement. **Required** tasks apply to all installations that enable this function. **Optional** tasks apply only when the listed condition is met. For more details on the procedures associated with a task, see the reference listed.

Task	Condition	Reference Information
Customize the Infoprint Server SNMP subagent, the z/OS SNMP agent, and an SNMP manager.	Required	*z/OS Infoprint Server Customization*

Task	Condition	Reference Information
Customize PSF for OS/390 to use the Printer Inventory.	Required	*PSF for OS/390 & z/OS: Customization*
Request SNMP reporting in PSF for OS/390 FSA definitions.	Required	*PSF for OS/390 & z/OS: Customization*
Start the z/OS SNMP agent and then start the Infoprint Server SNMP subagent.	Required	*z/OS Infoprint Server Operation and Administration*
Use diagnostic procedures for the SNMP subagent.	Optional: If problems arise	*z/OS Infoprint Server Messages and Diagnosis*

For More Information

For more detailed information about this support, refer to the following Infoprint Server, PSF for OS/390, and SecureWay® publications:

- *z/OS Infoprint Server Customization*
- *z/OS Infoprint Server Operation and Administration*
- *z/OS Infoprint Server Messages and Diagnosis*
- *PSF for OS/390 & z/OS: Customization*
- *z/OS Communications Server: IP Configuration Reference*

PSF for OS/390 Startup Enhancements

Description

The administrator can now specify PSF for OS/390 customization information in the Printer Inventory instead of in PSF startup procedures and PSF exit routines. To use this function, the administrator must create functional subsystem (FSS) and functional subsystem application (FSA) definitions in the Printer Inventory. This function lets the PSF administrator change printer information without restarting all of the printers in the functional subsystem (FSS).

What This Change Affects

This support affects PSF for OS/390 processing. Refer to the PSF for OS/390 publication listed below for migration information.

Dependencies

PSF for OS/390 must be customized to use the Printer Inventory.

Coexistence Considerations

Refer to the PSF for OS/390 publication listed below for migration information.

Migration Tasks

Refer to the PSF for OS/390 publication listed below for migration information.

For More Information

For more detailed information about this support, refer to the following Infoprint Server and PSF for OS/390 publications:

- *z/OS Infoprint Server Operation and Administration*
- *PSF for OS/390 & z/OS: Customization*

Chapter 5. Summary of Interface Changes

This chapter summarizes the new and changed interfaces for Infoprint Server introduced in OS/390 Version 2 Release 8 and in z/OS Version 1 Release 2.

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Application Programming Interface (API) Functions

Table 12 on page 111 lists the functions in the new Infoprint Server application programming interface (API). These functions are defined in header file **aopapi.h**. Refer to *z/OS Infoprint Server Customization* for detailed information about these functions.

Table 11. Summary of Changes to Application Programming Interface

API Function	Release	Description	Related Support
AbortPrintFile	OS/390 V2R8	**New:** Terminates an Infoprint Server print job.	Print Interface API
BeginEnumJobs	OS/390 V2R8	**New:** Begins an enumeration of Infoprint Server print jobs for a printer.	Print Interface API
BeginEnumPrinters	OS/390 V2R8	**New:** Begins an enumeration of Infoprint Server printers.	Print Interface API
BufferSizeRequired	OS/390 V2R8	**New:** Returns the required buffer size after a buffer overflow error.	Print Interface API
CancelJob	OS/390 V2R8	**New:** Cancels an Infoprint Server print job.	Print Interface API
ClosePrintFile	OS/390 V2R8	**New:** Closes an Infoprint Server print job.	Print Interface API
CreatePrintFile	OS/390 V2R8	**New:** Creates an Infoprint Server print job.	Print Interface API
EndEnumJobs	OS/390 V2R8	**New:** Ends an enumeration of Infoprint Server print jobs for a printer.	Print Interface API
EndEnumPrinters	OS/390 V2R8	**New:** Ends an enumeration of Infoprint Server printers.	Print Interface API
EnumJobs	OS/390 V2R8	**New:** Returns an enumeration of Infoprint Server print jobs for a printer.	Print Interface API
EnumPrinters	OS/390 V2R8	**New:** Returns an enumeration of Infoprint Server printers.	Print Interface API
ErrorNumber	OS/390 V2R8	**New:** Returns the API error code.	Print Interface API
ErrorString	OS/390 V2R8	**New:** Returns a pointer to an API error message.	Print Interface API
GetJobInfo	OS/390 V2R8	**New:** Returns status of an Infoprint Server print job.	Print Interface API
GetPrinterInfo	OS/390 V2R8	**New:** Returns information about an Infoprint Server printer.	Print Interface API
InitAPI	OS/390 V2R8	**New:** Initializes the API.	Print Interface API
ReleaseTransform	OS/390 V2R8	**New:** Ends the connection between a transform filter and the Transform Manager.	Print Interface API
RequestTransform	OS/390 V2R8	**New:** Connects a transform filter to the Transform Manager.	Print Interface API
SetTerminationHandler	OS/390 V2R8	**New:** Registers a function to be called at program termination.	Print Interface API
TermAPI	OS/390 V2R8	**New:** Terminates the API.	Print Interface API
WritePrintFile	OS/390 V2R8	**New:** Writes data to an Infoprint Server print job.	Print Interface API

Configuration Files

Table 12 identifies changes to Infoprint Server configuration files. Refer to *z/OS Infoprint Server Customization* for detailed information about these configuration files.

Table 12. Summary of Changes to Configuration Files

Configuration File	Release	Description	Related Support
aopd.conf	OS/390 V2R8	**Updated:** This optional file contains the following new and changed attributes: • **New: inventory**, an optional attribute used to change the default name (AOP1) for the Printer Inventory. • **New: ipp-port-number**, an optional attribute used to change the default port (port 631) for the Internet Printing Protocol server. • **Updated: server-port** is replaced by **lpd-port-number**, an optional attribute used to change the default port (port 515) for the Infoprint Server **lpd**; however **server-port** is still accepted. • **New: snmp-community**, an optional attribute used to change the default community name used by the Infoprint Server SNMP subagent. • **New: start-daemons**, an optional attribute that lets you specify which Infoprint Server daemons are to be started. By default, the same daemons are started as in previous releases (**aopd** and **aoplpd**).	Printer Inventory, Print Interface IPP Server, SNMP Subagent, and Transforms.
	z/OS V1R2	**Updated:** The new **subd** value for the **start-daemons** attribute lets you start the Print Interface subsystem daemon.	Print Interface Subsystem for Batch Applications
aopsapd.conf	OS/390 V2R8	**New:** This SAP Callback daemon configuration file is required if you use the Print Interface SAP Output Management System (SAP) with the SAP R/3 Application Server for z/OS.	Print Interface SAP Output Management System
aopxfd.conf	OS/390 V2R8	**New:** This transform configuration file is required if you use Infoprint Server Transforms to transform PCL, PDF, or PostScript data to AFP format. It is also required if you use Infoprint Server Transforms to transform AFP or line data to PCL, PDF, or PostScript format.	Transforms, AFP to PCL, AFP to PDF, and AFP to PostScript Transforms
	OS/390 V2R8	**Updated:** You can specify the following new environment variables in this file: • AOP_CUTSHEET for the AFP to PCL, AFP to PDF, and AFP to PostScript transforms • AOP_FLATE for the AFP to PDF transform • AOP_PJL for the AFP to PCL transform The AOP_PAPER environment variable for the AFP to PCL, AFP to PDF, and AFP to PostScript transforms now accepts the A5 value.	Transform Enhancements

Interface Changes

Table 12. Summary of Changes to Configuration Files (continued)

Configuration File	Release	Description	Related Support
barcode.tab **defcp.tab** **fonts.tab** **image.tab** **pagedef.tab** **printer.tab** ***xxxx*0000.tab**	OS/390 V2R8	**New:** These transform configuration files are required if you use Infoprint Server Transforms to transform SAP data to AFP format.	Transforms
UserInit **preload.ps**	OS/390 V2R8	**New:** These transform configuration files are required if you use Infoprint Server Transforms to transform PostScript data to AFP format.	Transforms

Data Sets and Files

Table 13 identifies changes to data sets and files used by Infoprint Server V2R8. Refer to *z/OS Infoprint Server Operation and Administration* for detailed information about the Printer Inventory. Refer to *z/OS Infoprint Server Customization* for detailed information about the IP PrintWay transmission-queue and message-log data sets.

Table 13. Summary of Changes to Data Sets

Data Set	Release	Description	Related Support
Infoprint Server Printer Inventory	OS/390 V2R8	**New:** HFS files that contains information about printers and functional subsystems.	Printer Inventory
IP PrintWay Routing (ANF.ROUTING)	OS/390 V2R8	**Deleted:** This data set is obsolete, replaced by the Infoprint Server Printer Inventory.	Printer Inventory
IP PrintWay Options (ANF.OPTIONS)	OS/390 V2R8	**Deleted:** This data set is obsolete, replaced by the Infoprint Server Printer Inventory.	Printer Inventory
IP PrintWay Transmission Queue (ANF.QUEUE)	OS/390 V2R8	**Updated:** The format of this data set has changed and the data set must be recreated. The administrator now uses Infoprint Server ISPF panels to view entries.	Printer Inventory
IP PrintWay Message-Log (ANF.MSGFILE)	OS/390 V2R8	**Updated:** The administrator now uses Infoprint Server ISPF panels to view IP PrintWay messages using the automatic browse feature.	Printer Inventory
NetSpool Page-Format Table (APIPPPFT)	OS/390 V2R8	**Deleted:** This data set is obsolete, replaced by the Infoprint Server Printer Inventory.	Printer Inventory
NetSpool End-of-File Rules Table (APIPPEFT)	OS/390 V2R8	**Deleted:** This data set is obsolete, replaced by the Infoprint Server Printer Inventory.	Printer Inventory
NetSpool Print Characteristics	OS/390 V2R8	**Deleted:** This data set is obsolete, replaced by the Infoprint Server Printer Inventory.	Printer Inventory
Print Interface Printer Inventory	OS/390 V2R8	**Deleted:** These HFS files are obsolete, replaced by the Infoprint Server Printer Inventory.	Printer Inventory

Environment Variables

Table 14 identifies changes to environment variables used by Infoprint Server in OS/390 V2R8. Refer to *z/OS Infoprint Server Customization* for detailed information about these environment variables.

Table 14. Summary of Changes to Environment Variables

Environment Variable	Release	Description	Related Support
AOPMAILER	z/OS V1R2[1]	**New:** An optional variable to specify the location of the z/OS UNIX sendmail executable file.	IP PrintWay E-mail Support
AOPOPTIONS	OS/390 V2R8	**New:** An optional variable to specify job attributes used by the **lp** command.	Print Interface lp Command Enhancements
AOP_SAP2AFP_ RESOURCES	OS/390 V2R8	**New:** An optional variable to change the default SAP to AFP transform resources directory.	Transforms
AOPSAPD_CONF	OS/390 V2R8	**New:** An optional variable to change the default path for the **aopsapd.conf** configuration file.	Print Interface SAP Output Management System
AOPXFD_CONF	OS/390 V2R8	**New:** An optional variable to change the default path for the **aopxfd.conf** configuration file.	Transforms
CLASSPATH	OS/390 V2R8	**New:** An optional variable to change the default directory for files required by the Print Interface IPP server.	Print Interface IPP Server
NLSPATH	OS/390 V2R8	**Updated:** Identifies the location of the Infoprint Server message catalog. The Infoprint Server English message catalog has been moved to directory **/usr/lpp/Printsrv/En_US/%N** from **/usr/lpp/Printsrv/en_US/%N**. (Note the change from a lowercase e to an uppercase E in **En_US**.)	Printer Inventory

1. These changes have been rolled back to OS/390 V2R8 and later releases.

Exits

Table 15 identifies changes to NetSpool and IP PrintWay exit routines. Refer to *z/OS Infoprint Server Customization* for detailed information about these exits.

Note: Due to changes in the IP PrintWay data area, ANFUEXTP, all IP PrintWay exits must be reassembled when you migrate to OS/390 V2R8 through z/OS V1R1.

Table 15. Summary of Changes to Exit Routines

Exit Name	Release	Description	Related Support
NetSpool Transparent Data Exit (APIPPTD2) and Beginning of File Exit for SCS Data (APIPPTD1)	OS/390 V2R8	**Updated:** These exits must now be link edited into an APF-authorized library.	Printer Inventory
	z/OS V1R2	**Updated:** Field S2FLAGS is new in the NetSpool APIPP1X2 macro, which maps the input control block to NetSpool exits. This field identifies the LU type of the VTAM session and the type of output data stream NetSpool creates (line or PCL data stream).	NetSpool PCL Conversion

Interface Changes

Table 15. Summary of Changes to Exit Routines (continued)

Exit Name	Release	Description	Related Support
NetSpool Beginning of File Exit for 3270 Data Streams (APIUBF3)	z/OS V1R2	**New:** This exit lets you add PCL commands and text to the beginning of each output data set.	NetSpool Exit Enhancements
NetSpool Graphic Escape Exit (APIUGEX)	z/OS V1R2	**New:** This exit lets you replace Graphic Escape characters with other printable characters.	NetSpool Exit Enhancements

Table 15. Summary of Changes to Exit Routines (continued)

Exit Name	Release	Description	Related Support
IP PrintWay Routing (ANFUXRTG)	OS/390 V2R8	**Updated:** The format of the ANFUEXTP data area is changed and the contents of the fields have changed: • **Updated:** Field XTPIPADR can contain the IP address, the URL, or the VTAM LU name of the target printer, depending on the transmission protocol IP PrintWay uses. • **Updated:** Field XTPKEY (same field as XTPDEST, XTPCLASS, and XTPFORMS) contains either a printer definition name or the DEST, CLASS, and FORMS associated with the printer definition. XTPDEST, XTPCLASS, or XTPFORMS contains blanks if the value is blank in the printer definition. • **Updated:** Field XTPPRTQU can contain the print queue name, port number, or the VTAM logon mode entry name, depending on the transmission protocol IP PrintWay uses. • **Updated:** Field XTPOPTNM contains the name of components, instead of an options entry name. • **Updated:** Field XTPOLEN is no longer input to this exit. • **New:** Field XTPOPTNS contains IP PrintWay formatting and transmission options for the data set. • **New:** Field XTP_ROUTING_KEY_TYPE identifies the contents of field XTPKEY and is input to the exit. • **New:** Field XTP_ADDR_TYPE identifies the contents of fields XTPIPADR and XTPPRTQU and is input to the exit. • **Deleted:** Field XTPLPROP no longer contains formatting and transmission options.	Printer Inventory, IP PrintWay Printer Selection with FSSDATA JCL Parameter, IP PrintWay IPP Client, and IP PrintWay VTAM Printer Support
	z/OS V1R2[1]	**Updated:** The contents of the following fields in control block ANFUEXTP have changed: • **Updated:** Field XTP_ADDR_TYPE contains a value of 4 if the e-mail protocol is selected in the printer definition. • **Updated:** Field XTPIPADR contains the recipient e-mail addresses list if field XTP_ADDR_TYPE contains a value of 4.	IP PrintWay E-mail Support
	z/OS V1R2[1]	**Updated:** Field XTPUSRID in control block ANFUEXTP now always contains the user ID of the job submitter when Print Interface has allocated the output data set on the JES spool. If the job was originally submitted from a remote system, then this user ID is from the remote system.	IP PrintWay Resubmit for Filtering Enhancements

Interface Changes

Table 15. Summary of Changes to Exit Routines (continued)

Exit Name	Release	Description	Related Support
IP PrintWay Begin Data Set	OS/390 V2R8	**Updated:** The format of the ANFUEXTP data area is changed and the contents of the fields have changed: • **Updated:** Field XTPIPADR can contain the IP address, the URL, or the VTAM LU name of the target printer, depending on the transmission protocol IP PrintWay uses. • **Updated:** Field XTPKEY (same field as XTPDEST, XTPCLASS, and XTPFORMS) contains either a printer definition name or the DEST, CLASS, and FORMS associated with the printer definition. XTPDEST, XTPCLASS, or XTPFORMS contains blanks if the value is blank in the printer definition. • **Updated:** Field XTPOPTNM contains the name of components, instead of an options entry. • **Updated:** Field XTPOLEN is no longer input to this exit. • **New:** Field XTPOPTNS contains IP PrintWay formatting and transmission options for the data set. • **Updated:** Field XTPPRTQU can contain the print queue name, port number, or the VTAM logon mode entry name, depending on the transmission protocol IP PrintWay uses. • **New:** Field XTP_ROUTING_KEY_TYPE identifies the contents of XTPKEY and is input to the exit. • **New:** Field XTP_ADDR_TYPE identifies the contents of fields XTPIPADR and XTPPRTQU and is input to the exit. • **New:** Field XTP_FILTERING identifies whether IP PrintWay has resubmitted the data set to Print Interface so that a transform filter can be applied. • **Deleted:** Field XTPLPROP no longer contains formatting and transmission options.	Printer Inventory, IP PrintWay Printer Selection with FSSDATA JCL Parameter, IP PrintWay IPP Client, and IP PrintWay Transform Function

Table 15. Summary of Changes to Exit Routines (continued)

Exit Name	Release	Description	Related Support
IP PrintWay Begin Data Set	z/OS V1R2	**Updated:** IP PrintWay now calls this exit *before* printer instructions specified in the **Document header** field of the printer definition are added.	IP PrintWay Exit Enhancement
	z/OS V1R2[1]	**Updated:** The contents of the following fields in control block ANFUEXTP have changed: • **Updated:** Field XTP_ADDR_TYPE contains a value of 4 if the e-mail protocol is selected in the printer definition. • **Updated:** Field XTPIPADR contains the recipient e-mail addresses list if field XTP_ADDR_TYPE contains a value of 4.	IP PrintWay E-mail Support
	z/OS V1R2[1]	**Updated:** Field XTPUSRID in control block ANFUEXTP now always contains the user ID of the job submitter when Print Interface has allocated the output data set on the JES spool. If the job was originally submitted from a remote system, then this user ID is from the remote system.	IP PrintWay Resubmit for Filtering Enhancements

Interface Changes

Table 15. Summary of Changes to Exit Routines (continued)

Exit Name	Release	Description	Related Support
IP PrintWay Record	OS/390 V2R8	**Updated:** The format of the ANFUEXTP data area is changed and the contents of the fields have changed: • **Updated:** Field XTPIPADR can contain the IP address, the URL, or the VTAM LU name of the target printer, depending on the transmission protocol IP PrintWay uses. • **Updated:** Field XTPKEY (same field as XTPDEST, XTPCLASS, and XTPFORMS) contains either a printer definition name or the DEST, CLASS, and FORMS associated with the printer definition. XTPDEST, XTPCLASS, or XTPFORMS contains blanks if the value is blank in the printer definition. • **Updated:** Field XTPOLEN is no longer input to this exit. • **New:** Field XTPOPTNS contains IP PrintWay formatting and transmission options for the data set. • **Updated:** Field XTPPRTQU can contain the print queue name, port number, or the VTAM logon mode entry name, depending on the transmission protocol IP PrintWay uses. • **New:** Field XTP_ROUTING_KEY_TYPE identifies the contents of XTPKEY and is input to the exit. • **New:** Field XTP_ADDR_TYPE identifies the contents of fields XTPIPADR and XTPPRTQU and is now input to the exit. • **Deleted:** Field XTPLPROP no longer contains formatting and transmission options.	Printer Inventory, IP PrintWay Printer Selection with FSSDATA JCL Parameter, IP PrintWay IPP Client, and IP PrintWay VTAM Printer Support
	z/OS V1R2[1]	**Updated:** The contents of the following fields in control block ANFUEXTP have changed: • **Updated:** Field XTP_ADDR_TYPE contains a value of 4 if the e-mail protocol is selected in the printer definition. • **Updated:** Field XTPIPADR contains the recipient e-mail addresses list if field XTP_ADDR_TYPE contains a value of 4.	IP PrintWay E-mail Support
	z/OS V1R2[1]	**Updated:** Field XTPUSRID in control block ANFUEXTP now always contains the user ID of the job submitter when Print Interface has allocated the output data set on the JES spool. If the job was originally submitted from a remote system, then this user ID is from the remote system.	IP PrintWay Resubmit for Filtering Enhancements

Table 15. Summary of Changes to Exit Routines (continued)

Exit Name	Release	Description	Related Support
IP PrintWay End Data Set	OS/390 V2R8	**Updated:** The format of the ANFUEXTP data area is changed and the contents of the fields have changed: • **Updated:** Field XTPIPADR can contain the IP address, the URL, or the VTAM LU name of the target printer, depending on the transmission protocol IP PrintWay uses. • **Updated:** Field XTPKEY (same field as XTPDEST, XTPCLASS, and XTPFORMS) contains either a printer definition name or the DEST, CLASS, and FORMS associated with the printer definition. XTPDEST, XTPCLASS, or XTPFORMS contains blanks if the value is blank in the printer definition. • **Updated:** Field XTPOPTNM contains the name of components instead of an options entry. • **Updated:** Field XTPOLEN is no longer input to this exit. • **New:** Field XTPOPTNS contains IP PrintWay formatting and transmission options for the data set. • **Updated:** Field XTPPRTQU can contain the print queue name, port number, or the VTAM logon mode entry name, depending on the transmission protocol IP PrintWay uses. • **New:** Field XTP_ROUTING_KEY_TYPE identifies the contents of XTPKEY and is input to the exit. • **New:** Field XTP_ADDR_TYPE identifies the contents of fields XTPIPADR and XTPPRTQU and is input to the exit. • **New:** Field XTP_FILTERING identifies whether IP PrintWay has resubmitted the data set to Print Interface so that a transform filter can be applied. • **Deleted:** Field XTPLPROP no longer contains formatting and printing options.	Printer Inventory, IP PrintWay Printer Selection with FSSDATA JCL Parameter, IP PrintWay IPP Client, IP PrintWay Transform Function, and IP PrintWay VTAM Printer Support

Interface Changes

Table 15. Summary of Changes to Exit Routines (continued)

Exit Name	Release	Description	Related Support
IP PrintWay End Data Set	z/OS V1R2	**Updated:** IP PrintWay now calls this exit *after* printer instructions specified in the **Document trailer** field of the printer definition are added.	IP PrintWay Exit Enhancement
	z/OS V1R2[1]	**Updated:** The contents of the following fields in control block ANFUEXTP have changed: • **Updated:** Field XTP_ADDR_TYPE contains a value of 4 if the e-mail protocol is selected in the printer definition. • **Updated:** Field XTPIPADR contains the recipient e-mail addresses list if field XTP_ADDR_TYPE contains a value of 4.	IP PrintWay E-mail Support
	z/OS V1R2[1]	**Updated:** Field XTPUSRID in control block ANFUEXTP now always contains the user ID of the job submitter when Print Interface has allocated the output data set on the JES spool. If the job was originally submitted from a remote system, then this user ID is from the remote system.	IP PrintWay Resubmit for Filtering Enhancements
IP PrintWay SMF (ANFUXSMF)	OS/390 V2R8	**Updated:** The format of the ANFUEXTP data area is changed and the contents of the fields have changed: • **Updated:** Field XTPIPADR can contain the IP address, the URL, or the VTAM LU name of the target printer, depending on the transmission protocol IP PrintWay uses. • **Updated:** Field XTPKEY (same field as XTPDEST, XTPCLASS, and XTPFORMS) contains either a printer definition name or the DEST, CLASS, and FORMS associated with the printer definition. XTPDEST, XTPCLASS, or XTPFORMS contains blanks if the value is blank in the printer definition. • **Updated:** Field XTPPRTQU can contain the print queue name, port number, or the VTAM logon mode entry name, depending on the transmission protocol IP PrintWay uses. • **New:** Field XTP_ROUTING_KEY_TYPE identifies the contents of XTPKEY and is input to the exit. • **New:** Field XTP_FILTERING identifies whether IP PrintWay is resubmitting the data set to Print Interface so that a transform filter can be applied. • **New:** Field XTP_ADDR_TYPE identifies the contents of fields XTPIPADR and XTPPRTQU and is input to the exit.	IP PrintWay Printer Selection with FSSDATA JCL Parameter, IP PrintWay IPP Client, IP PrintWay Transform Function, and IP PrintWay VTAM Printer Support
	z/OS V1R2[1]	**Updated:** Field XTPUSRID in control block ANFUEXTP now always contains the user ID of the job submitter when Print Interface has allocated the output data set on the JES spool. If the job was originally submitted from a remote system, then this user ID is from the remote system.	IP PrintWay Resubmit for Filtering Enhancements

Table 15. Summary of Changes to Exit Routines (continued)

Exit Name	Release	Description	Related Support
IP PrintWay Message (ANFUXMSG)	OS/390 V2R8	**Updated:** The format of the ANFUEXTP data area is changed. Input and output fields to this exit are unchanged.	Printer Inventory
IP PrintWay Response Notification (ANFUXRSP)	OS/390 V2R8	**Updated:** The format of the ANFUEXTP data area is changed and the contents of the fields have changed: • **Updated:** Field XTPIPADR can contain the IP address, the URL, or the VTAM LU name of the target printer, depending on the transmission protocol IP PrintWay uses. • **Updated:** Field XTPKEY (same field as XTPDEST, XTPCLASS, and XTPFORMS) contains either a printer definition name or the DEST, CLASS, and FORMS associated with the printer definition. XTPDEST, XTPCLASS, or XTPFORMS contains blanks if the value is blank in the printer definition. • **Updated:** Field XTPOPTNM contains the name of components, instead of an options entry. • **Updated:** Field XTPOLEN is still a valid field but is no longer input to this exit. • **New:** Field XTPOPTNS contains IP PrintWay formatting and transmission options for the data set. • **Updated:** Field XTPPRTQU can contain the print queue name, port number, or the VTAM logon mode entry name, depending on the transmission protocol IP PrintWay uses. • **New:** Field XTP_ROUTING_KEY_TYPE identifies the contents of XTPKEY and is input to the exit. • **New:** Field XTP_ADDR_TYPE identifies the contents of fields XTPIPADR and XTPPRTQU and is input to the exit. • **Deleted:** Field XTPLPROP no longer contains formatting and printing options. • **New:** Field XTP_FILTERING identifies whether IP PrintWay has resubmitted the data set to Print Interface so that a transform filter can be applied.	Printer Inventory, IP PrintWay Printer Selection with FSSDATA JCL Parameter, IP PrintWay IPP Client, IP PrintWay Transform Function, and IP PrintWay VTAM Printer Support

1. This change has been rolled back to OS/390 V2R8 and later releases.

File Systems — /etc and /var Directories

Table 16 identifies changes to files used by Infoprint Server in V2R8 in the **/etc** and **/var** directories. See "Configuration Files" on page 111 for a summary of the changes to these files. Refer to *z/OS Infoprint Server Customization* for detailed information about the files in these file systems.

Table 16. Summary of Changes to /etc and /var Directories

Directory	Release	Description	Related Support
/etc/Printsrv/	OS/390 V2R8	The **/etc/Printsrv/** directory contains the following files: • **Updated: /etc/Printsrv/aopd.conf** is the default location for the Infoprint Server configuration file; the file location can be changed in the **AOPCONF** environment variable. You can specify new statements in this file. • **New: /etc/Printsrv/aopxfd.conf** is the default location for the new transform configuration file; the file location can be changed in the **AOPXFD_CONF** environment variable. • **New: /etc/Printsrv/aopsapd.conf** is the default location for the new SAP Callback daemon configuration file; the file location can be changed in the **AOPSAPD_CONF** environment variable.	Printer Inventory, Print Interface IPP Server, SNMP Subagent, Transforms, and Print Interface SAP Output Management System
/var/Printsrv/	OS/390 V2R8	The **/var/Printsrv/** directory contains the following sub-directories and files: • **Deleted: /var/Printsrv/printers/** is the default sub-directory for the files that comprise the Print Interface printer inventory. These files are input to the Infoprint Server migration program; otherwise, they are obsolete. You do not need to delete this directory; in fact, you might want to save it for reference purposes. • **New: /var/Printsrv/** is the default directory for the Printer Inventory; the directory location can be changed in the **base-directory** statement in the Infoprint Server configuration file **aopd.conf**.	Printer Inventory

Filters

Table 17 on page 123 identifies changes to filter programs provided by Infoprint Server and Infoprint Server Transforms in V2R8. Table 18 on page 123 identifies changes to installation-writen filter programs that Print Interface can call before writing data to the JES spool. Refer to *z/OS Infoprint Server Customization* for detailed information about these filters.

Table 17. Summary of Changes to Filters Provided with Infoprint Server or Infoprint Server Transforms

Filter Name	Release	Description	Related Support
afp2pcl.dll	OS/390 V2R8	**New:** Transforms line data and data in AFP format (MO:DCA-P) to PCL format on the z/OS system; provided by the AFP to PCL Transform feature of Infoprint Server Transforms.	AFP to PCL, AFP to PDF, and AFP to PostScript Transforms
afp2pdf.dll	OS/390 V2R8	**New:** Transforms line data and data in AFP format (MO:DCA-P) to PDF format on the z/OS system; provided by the AFP to PDF Transform feature of Infoprint Server Transforms.	AFP to PCL, AFP to PDF, and AFP to PostScript Transforms
afp2ps.dll	OS/390 V2R8	**New:** Transforms line data and data in AFP format (MO:DCA-P) to PostScript format on the z/OS system; provided by the AFP to PostScript Transform feature of Infoprint Server Transforms.	AFP to PCL, AFP to PDF, and AFP to PostScript Transforms
aoprform.dll	OS/390 V2R8	**New:** Transforms data remotely using Infoprint Manager for AIX or PSF for AIX.	Print Interface Remote Transforms
	z/OS V1R2[1]	**New:** The **-q** option lets you specify transform attributes for the Infoprint Manager PostScript and PDF to AFP color transform. **Updated:** The **-a** option lets you specify the **fs45** value to create images in the format required by the IBM Infoprint Color 130 Plus printer.	Print Interface Remote Transform Support for IBM Infoprint Color 130 Plus Printer
lpd_compat.so	OS/390 V2R8	**New:** Provides function that is similar to the z/OS TCP/IP LPD.	Print Interface LPD Compatibility Filter
pcl2afp.dll	OS/390 V2R8	**New:** Transforms PCL data to AFP format (MO:DCA-P) on the z/OS system; provided by Infoprint Server Transforms.	Transforms
ps2afp.dll	OS/390 V2R8	**New:** Transforms PostScript and PDF data to AFP format (MO:DCA-P) on the z/OS system; provided by Infoprint Server Transforms.	Transforms
sap2afp.dll	OS/390 V2R8	**New:** Transforms SAP data to AFP format (MO:DCA-P) on the z/OS system; provided by Infoprint Server Transforms.	Transforms

1. This change has been rolled back to OS/390 V2R8 and later releases.

Table 18. Summary of Changes to Installation-Written Filters

Type of Filter	Release	Description	Related Support
DLL filter	OS/390 V2R8	**Changed:** The name of the file to be printed and the name of the printer definition are now passed as input to DLL filters. A DLL filter can also request that one or more Infoprint Server job attributes be passed as input, and can now set any job attribute that is not set by the job submitter.	Print Interface Filter Enhancements
UNIX filter	OS/390 V2R8	**New:** An installation can now write a UNIX-style filter program instead of a DLL-style filter. A UNIX filter can perform the same functions as a DLL filter; however, a DLL filter cannot set job attributes.	Print Interface Filter Enhancements

Infoprint Port Monitor for Windows

Table 19 identifies changes to the Infoprint Port Monitor for Windows. Refer to *z/OS Infoprint Server User's Guide* for detailed information about the port monitor.

Table 19. Summary of Changes to the Infoprint Port Monitor for Windows

Infoprint Port Monitor Option	Release	Description	Related Support
Options option	OS/390 V2R8	**New:** This option displays the new Infoprint Port Monitor Options dialog, which lets you specify information for a separator sheet and other Infoprint Server job attributes.	Print Interface Infoprint Port Monitor for Windows Enhancements
Unattended mode option	z/OS V1R2 [1]	**New:** This option indicates that a printer at an Infoprint port is used by Windows users on other systems. When selected, the Infoprint Port Monitor does not display error messages that require a response.	Print Interface Infoprint Port Monitor for Windows Enhancements

1. This change has been rolled back to OS/390 V2R8 and later releases.

Infoprint Server ISPF Panels

Table 20 identifies changes to the ISPF panels for Infoprint Server. The Infoprint Server ISPF panels are new in OS/390 V2R8; however, some of the field names are the same as in the previous Print Interface and IP PrintWay ISPF panels.

See Appendix B, "Migration Tables" on page 169 for tables that show how old ISPF panel fields correspond to new ISPF panel fields. Also refer to *z/OS Infoprint Server Operation and Administration* for information about ISPF panel fields, and use the online help in the Infoprint Server ISPF panels for detailed information about each field.

Table 20. Summary of Changes to ISPF Panels

ISPF Panels	Release	Description	Related Support
Infoprint Server	OS/390 V2R8	Infoprint Server ISPF panels consist of new panels and also some updated IP PrintWay ISPF panels: • **New:** The Infoprint Server ISPF panels let the administrator create and manage printer definitions, printer pool definitions, FSS definitions and FSA definitions in the Printer Inventory. • **Updated:** The IP PrintWay transmission-queue panels contain new and updated fields and new panels. New fields display the printer definition name, the transmission protocol, the URL of the target printer, and the VTAM LU name and logon mode name. New panels display the IP PrintWay formatting and translation options used to transmit the data set. • **Updated:** The administrator now specifies the name of the IP PrintWay message-log data set on the Infoprint Server Configuration panel.	Printer Inventory

Table 20. Summary of Changes to ISPF Panels (continued)

ISPF Panels	Release	Description	Related Support
IP PrintWay	OS/390 V2R8	**Deleted:** The new Infoprint Server ISPF panels replace the IP PrintWay panels.	Printer Inventory
Print Interface	OS/390 V2R8	**Deleted:** The new Infoprint Server ISPF panels replace the Print Interface panels.	Printer Inventory
Printer Definition panels	OS/390 V2R8	**New:** The **Resubmit for filtering** field enables the IP PrintWay transform function.	IP PrintWay Transform Function
		• **New:** The **Printer LU name** field lets you specify the LU name of the printer for the IP PrintWay VTAM protocol. • **New:** The **Printer logmode** field lets you specify the VTAM logon mode name for the IP PrintWay VTAM protocol.	IP PrintWay VTAM Printer Support
	z/OS V1R2	• **New:** The **Optimize copies** field lets you control how IP PrintWay transmits files when printing copies of a data set. • **Updated:** The **Maximum copies** field lets you specify the maximum number of copies for jobs that IP PrintWay handles.	IP PrintWay Copy Support for LAN Printers
		• **Updated:** The **Formatting** field lets you select a new value, **Convert to PCL**. The **Standard** value is now called **Convert to line**. • **New:** The **Line density** field lets you specify the number of lines per inch when NetSpool converts data to PCL format. • **New:** The **Orientation** field lets you specify portrait or landscape orientation when NetSpool converts data to PCL format. • **New:** The **Print density** field lets you specify the number of characters per inch when NetSpool converts data to PCL format. • **New:** The **SCS automatic page orientation** field lets you request that NetSpool automatically determine the appropriate page orientation, portrait or landscape, for each page.	NetSpool PCL Conversion
		• **Updated:** The **Copies** field lets you specify a value up to 32640. • **Updated:** The **Maximum copies** field lets you specify a value up to 32640.	Print Interface >255 Copies Support

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Table 20. Summary of Changes to ISPF Panels (continued)

ISPF Panels	Release	Description	Related Support
Printer Definition panels	z/OS V1R2[1]	• **New:** The new E-mail Protocol panel lets you specify a list of e-mail addresses in the **E-mail addresses** field. • **Updated:** The IP PrintWay **None** formatting option now applies when you select the IP PrintWay VTAM protocol. • **Updated:** The Choose a Definition Type and Protocol panel now lets you select the IP PrintWay E-mail Protocol.	IP PrintWay E-mail Support
		• **New:** The VTAM Protocol panel now displays the **Save as transparent data** field. • **Updated:** The IP PrintWay **none** formatting option now applies when you select the IP PrintWay VTAM protocol. • **Updated:** The **Delete form feed** field now applies when you select the IP PrintWay VTAM protocol. • **Updated:** The **Line termination** field now applies when you select the IP PrintWay VTAM protocol.	IP PrintWay Enhancements for Printing to VTAM Printers
		New: The IP PrintWay Options panel now displays the **Connection timeout** field.	IP PrintWay TCP/IP Connection Timeout Enhancement
IP PrintWay Queue panels	z/OS V1R2	**Updated:** Action values **S** and **L** now let you query the status of the printer.	IP PrintWay Query Printer Status
PSF for OS/390 FSA Definition panels	z/OS V1R2[1]	**New:** The **Retained Resource Counts** fields let you specify the number of resources that PSF for OS/390 is to retain in storage between print jobs.	PSF for OS/390 FSA Definition Enhancements

1. These changes have been rolled back to OS/390 V2R8 and later releases.

JCL Parameters on OUTPUT and DD Statements

Table 21 lists the changes to the parameters a user can specify on an OUTPUT JCL statement when printing to a printer controlled by IP PrintWay or when using the Print Interface subsystem. Refer to *z/OS Infoprint Server User's Guide* for detailed information about these parameters.

Table 21. Summary of Changes to Parameters on an OUTPUT JCL Statement

Parameter (OUTPUT statement)	Release	Description	Related Support
AFP parameters[1]	OS/390 V2R8	**Updated:** A user can now specify AFP parameters on an OUTPUT JCL statement when transforming AFP data to PCL, PostScript, or PDF format. The AFP to PCL, AFP to PDF, and AFP to PostScript transforms use these parameters. The IP PrintWay Transform function must be enabled in the printer definition (select the **Resubmit for filtering** field).	AFP to PCL, AFP to PDF, and AFP to PostScript Transforms, IP PrintWay Transform Function

Table 21. Summary of Changes to Parameters on an OUTPUT JCL Statement (continued)

Parameter (OUTPUT statement)	Release	Description	Related Support
DEFAULT=YES	z/OS V1R2	**New:** The Print Interface subsystem uses only the first default OUTPUT JCL statement in the job step or, if none is specified, the first default OUTPUT JCL statement in the job.	Print Interface Subsystem for Batch Applications
DEST, CLASS, FORMS	OS/390 V2R8	**Updated:** The user can now select an IP PrintWay printer by specifying one of these parameters (DEST, CLASS, or FORMS) or a combination of two or three of these parameters. Previously, IP PrintWay required that all three parameters (CLASS, DEST, and FORMS) match a routing entry in the IP PrintWay routing data set.	IP PrintWay Extended Routing Criteria
	z/OS V1R2	**Updated:** When the Print Interface subsystem is used, the user cannot select an IP PrintWay printer by specifying DEST, CLASS, or FORMS. The user must instead specify the printer definition name.	Print Interface Subsystem for Batch Applications
DEST=IP, PRTQUEUE, PORTNO	OS/390 V2R8	**Updated:** The user can specify these parameters with the new FSSDATA=printer parameter to override the IP address in the printer definition for the target printer.	IP PrintWay Printer Selection with FSSDATA JCL Parameter
	OS/390 V2R8	**Updated:** The user cannot specify these parameters when the resubmit for filtering function is used.	IP PrintWay Transform Function
FSSDATA= printer	OS/390 V2R8	**New:** This parameter lets users select the IP PrintWay printer by specifying the name of the printer definition in the Printer Inventory.	IP PrintWay Printer Selection with FSSDATA JCL Parameter
GROUPID	OS/390 V2R8	**Updated:** When the resubmit for filtering function is used, the data set is placed in a separate JES output subgroup, regardless of the value specified in this parameter.	IP PrintWay Transform Function
	z/OS V1R2	**Updated:** When the Print Interface subsystem is used, the data set is placed in a separate JES output subgroup, regardless of the value specified in this parameter.	Print Interface Subsystem for Batch Applications
JESNEWS	z/OS V1R2	**New:** When the Print Interface subsystem is used, JESNEWS is ignored.	Print Interface Subsystem for Batch Applications
PRTOPTNS	OS/390 V2R8	**Updated:** Users can specify the name of one or more components in the Printer Inventory. The components contain the formatting and transmission options that IP PrintWay uses to transmit the data set to the remote printer. Previously, users specified the name of an options entry in the IP PrintWay options data set.	Printer Inventory

1. AFP parameters are: CHARS, DUPLEX, FCB, FORMDEF, INTRAY, OUTBIN, OFFSETXB, OFFSETXF, OFFSETYB, OFFSETXB, OVERLAYB, OVERLAYF, PAGEDEF, PRMODE, TRC, UCS, USERLIB

Table 22 on page 128 lists the changes to the parameters a user can specify on a DD JCL statement when using the Print Interface subsystem. Refer to *z/OS Infoprint Server User's Guide* for detailed information about these parameters.

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Table 22. Summary of Changes to Parameters on a DD JCL Statement

Parameter (DD statement)	Release	Description	Related Support
BURST, CHARS, COPIES, DCB, DSNAME, FCB, FLASH, UCS	z/OS V1R2	**New:** The Print Interface subsystem supports these parameters of the DD JCL statement.	Print Interface Subsystem for Batch Applications
DSNAME	z/OS V1R2	**New:** The Print Interface subsystem requires format: &&*dsname*.	Print Interface Subsystem for Batch Applications
OUTPUT	z/OS V1R2	**New:** The Print Interface subsystem uses only the first reference coded in the OUTPUT parameter; other references are ignored.	Print Interface Subsystem for Batch Applications
SEGMENT, SYSOUT	z/OS V1R2	**New:** These parameters are not allowed when you use the Print Interface subsystem.	Print Interface Subsystem for Batch Applications
SUBSYS	z/OS V1R2	**New:** A user can now specify the SUBSYS parameter to request that the Print Interface subsystem process the data set.The subsystem lets you specify the following subparameters on the SUBSYS statement: • Name of the subsystem (required parameter) • Name of the printer definition in the Printer Inventory • Infoprint Server job attributes	Print Interface Subsystem for Batch Applications
All parameters of the DD JCL statement *except* those listed in this table.	z/OS V1R2	**New:** These parameters are ignored when you use the Print Interface subsystem.	Print Interface Subsystem for Batch Applications

Job Attributes

Table 23 lists the changes to the Infoprint Server job attributes a user can specify when submitting a print job to Infoprint Server. Refer to *z/OS Infoprint Server User's Guide* for detailed information about these job attributes.

Table 23. Summary of Changes to Job Attributes

Job Attribute	Release	Description	Related Support
address-text	OS/390 V2R8	**New:** This new attribute can be used instead of the **address1-text**, **address2-text**, **address3-text**, and **address4-text** attributes; however, all previous address attributes are still supported.	Print Interface lp Command Enhancements
chars	OS/390 V2R8	**Updated:** This attribute now requires that a set of font names be enclosed in braces instead of single or double quotation marks.	Print Interface lp Command Enhancements
copies	z/OS V1R2	**Updated:** This attribute now lets you specify up to 32640 copies.	Print Interface >255 Copies Support
filter-options	OS/390 V2R8	**New:** This attribute lets the user specify options used by the transform filters, the LPD compatibility filter, and by installation-written filters.	Transforms, Print Interface Remote Transforms, and Print Interface LPD Compatibility Filter
input-tray	OS/390 V2R8	**Updated:** This attribute now accepts any names defined by the administrator in a printer definition.	Print Interface lp Command Enhancements

Table 23. Summary of Changes to Job Attributes (continued)

Job Attribute	Release	Description	Related Support
input-tray-number	OS/390 V2R8	**New:** This attribute lets the user specify the number of an input tray to PSF and to the AFP to PCL, AFP to PDF, and AFP to PostScript transforms.	AFP to PCL, AFP to PDF, and AFP to PostScript Transforms
output-bin	OS/390 V2R8	**Updated:** This attribute now accepts any names defined by the administrator in a printer definition.	Print Interface lp Command Enhancements
output-bin-number	OS/390 V2R8	**New:** This attribute lets the user specify the number of an output bin to PSF and to the AFP to PCL, AFP to PDF, and AFP to PostScript transforms.	AFP to PCL, AFP to PDF, and AFP to PostScript Transforms
resource-library	OS/390 V2R8	**Updated:** This attribute now requires that a set of data sets be enclosed in braces instead of single or double quotation marks.	Print Interface lp Command Enhancements
shift-out-shift-in	OS/390 V2R8	**Updated:** This attribute now also accepts value **three**.	Print Interface lp Command Enhancements
sysout-dataset-name	z/OS V1R2[1]	**New:** This attribute lets you specify a name for the data set that Print Interface allocates on the JES spool.	
sysout-job-id	z/OS V1R2[1]	**New:** This attribute lets you specify a job ID for the data set that Print Interface allocates on the JES spool.	
sysout-job-name	z/OS V1R2[1]	**New:** This attribute lets you specify a job name for the data set that Print Interface allocates on the JES spool.	
AFP job attributes[2]	OS/390 V2R8	**Updated:** A user can now specify AFP job attributes on the **afp2pcl**, **afp2pcl**, and **afp2pcl** commands.	AFP to PCL, AFP to PDF, and AFP to PostScript Transforms
All job attributes	OS/390 V2R8	**Updated:** All job attributes are now allowed for all types of printer definitions (IP PrintWay, PSF for OS/390, and General). If the printer doesn't support the job attribute, it is ignored.	AFP to PCL, AFP to PDF, and AFP to PostScript Transforms

1. These changes have been rolled back to OS/390 V2R8 and later releases.

2. AFP attributes are: carriage-control-type, chars, document-format, duplex, form-definition, input-tray, output-bin, overlay-back, overlay-front, page-definition, resource-library, shift-out-shift-in, table-reference-characters, x-image-shift-back, x-image-shift-front, y-image-shift-back, y-image-shift-front

Messages

Refer to *OS/390 Summary of Message Changes* for a list of the new, changed, and deleted Infoprint Server messages for OS/390 V2R8.

Refer to the" Summary of Changes" section in *z/OS Infoprint Server Messages and Diagnosis* for a list of new, changed and deleted Infoprint Server messages for z/OS V1R2. This publication also describes the message format of all Infoprint Server messages.

PIDU Printer Attributes

Table 23 on page 128 lists changes to the printer attributes that the administrator can specify when the administrator uses the Printer Inventory Definition Utility (PIDU). PIDU lets you create and edit Printer Inventory objects, such as printer definitions and FSA definitions. Refer to *z/OS Infoprint Server Operation and Administration* for detailed information about these printer attributes.

Table 24. Summary of Changes to PIDU Printer Attributes

Printer Attribute	Release	Description	Related Support
connection-timeout	z/OS V1R2[1]	**New:** This attribute lets you specify the number of seconds to wait for TCP/IP to establish a connection with the printer.	IP PrintWay TCP/IP Connection Timeout Enhancement
copies	z/OS V1R2	**Updated:** You can now specify up to 32640 copies.	Print Interface >255 Copies Support
delete-form-feed	z/OS V1R2[1]	**New:** This attribute now applies when the IP PrintWay VTAM protocol is selected.	IP PrintWay Enhancements for Printing to VTAM Printers
email-to-address	z/OS V1R2[1]	**New:** This attribute lets you specify a list of e-mail addresses when the IP PrintWay e-mail protocol is selected.	IP PrintWay E-mail Support
line-termination	z/OS V1R2[1]	**Updated:** This attribute now applies when the IP PrintWay VTAM protocol is selected.	IP PrintWay Enhancements for Printing to VTAM Printers
maximum-copies	z/OS V1R2	**Updated:** IP PrintWay now uses this attribute to limit the number of copies.	IP PrintWay Copy Support for LAN Printers
		Updated: You can specify a value up to 32640.	Print Interface >255 Copies Support
netspool-formatting	z/OS V1R2	**Updated:** This attribute lets you select a new value, **convert-to-pcl**. Also, the **standard** value is now called **convert-to-line**.	NetSpool PCL Conversion
optimize-copies	z/OS V1R2	**New:** This attribute lets you control how IP PrintWay transmits files when printing multiple copies of a data set.	IP PrintWay Copy Support for LAN Printers
pcl-line-density	z/OS V1R2	**New:** This attribute lets you specify the number of lines per inch when NetSpool converts data to PCL format.	NetSpool PCL Conversion
pcl-orientation	z/OS V1R2	**New:** This attribute lets you specify portrait or landscape orientation when NetSpool converts data to PCL format.	NetSpool PCL Conversion
pcl-print-density	z/OS V1R2	**New:** This attribute lets you specify the number of characters per inch when NetSpool converts data to PCL format.	NetSpool PCL Conversion
printway-formatting	z/OS V1R2[1]	**Updated:** The **none** value now applies when the IP PrintWay VTAM protocol is selected.	IP PrintWay Enhancements for Printing to VTAM Printers
protocol	z/OS V1R2[1]	**Updated:** This attribute lets you specify the value **email** to select the IP PrintWay e-mail protocol.	IP PrintWay E-mail Support
retained-fonts	z/OS V1R2[1]	**New:** This attribute lets you specify the number of fonts that PSF for OS/390 is to retain in printer storage between print jobs.	PSF for OS/390 FSA Definition Enhancements

Table 24. Summary of Changes to PIDU Printer Attributes (continued)

Printer Attribute	Release	Description	Related Support
retained-form-definitions	z/OS V1R2[1]	**New:** This attribute lets you specify the number of form definitions that PSF for OS/390 is to retain in virtual storage between print jobs.	PSF for OS/390 FSA Definition Enhancements
retained-object-containers	z/OS V1R2[1]	**New:** This attribute lets you specify the number of object containers that PSF for OS/390 is to retain in printer storage between print jobs.	PSF for OS/390 FSA Definition Enhancements
retained-page-definitions	z/OS V1R2[1]	**New:** This attribute lets you specify the number of page definitions that PSF for OS/390 is to retain in virtual storage between print jobs.	PSF for OS/390 FSA Definition Enhancements
retained-page-segments	z/OS V1R2[1]	**New:** This attribute lets you specify the number of page segments that PSF for OS/390 is to retain in printer storage between print jobs.	PSF for OS/390 FSA Definition Enhancements
save-printer-information	z/OS V1R2[1]	**New:** This attribute lets you request that PSF for OS/390 save printer information when it starts the printer.	PSF for OS/390 FSA Definition Enhancements
scs-automatic-page-orientation	z/OS V1R2	**New:** This attribute lets you request that NetSpool automatically determine the appropriate page orientation, portrait or landscape for each page.	NetSpool PCL Conversion
vtam-send-as-transparent	z/OS V1R2[1]	**New:** This attribute lets you request that IP PrintWay send data to a VTAM-controlled printer as transparent data.	IP PrintWay Enhancements for Printing to VTAM Printers

1.   These changes have been rolled back to OS/390 V2R8 and later releases.

NetSpool Operator Commands

Table 25 identifies changes to the NetSpool operator commands for OS/390 V2R8. Refer to *z/OS Infoprint Server Operation and Administration* for detailed information about these commands.

Table 25. Summary of Changes to NetSpool Operator Commands

Command Name	Release	Description	Related Support
NetSpool WTOR	OS/390 V2R8	**Deleted:** The operator can no longer enter NetSpool commands by replying to the NetSpool WTOR message: **API0837I ENTER NetSpool operator command.** The operator must use the MVS MODIFY command to enter NetSpool commands.	NetSpool Operator Command Enhancements

Interface Changes

Table 25. Summary of Changes to NetSpool Operator Commands (continued)

Command Name	Release	Description	Related Support
DISPLAY	OS/390 V2R8	**Updated:** This command contains changes to keywords and states: • **Deleted:** ALL and NOTSEL keywords; instead, the operator can use ISPF panels to list all printers configured for use with NetSpool. • **New:** LUNAME and TRACE keywords. The LUNAME keyword lets the operator see the status of one NetSpool printer logical unit (LU); the TRACE keyword lets the operator see which logical units are being traced. • **New:** PENDING CLOSE state. If NetSpool is in the process of stopping a printer LU, the new status of PENDING CLOSE is displayed.	NetSpool Operator Command Enhancements
LUNAME PURGE	OS/390 V2R8	**New:** This command deactivates the printer LU in VTAM immediately and then stops NetSpool processing for that printer LU. It is useful for error situations.	NetSpool Operator Command Enhancements
REFRESH	OS/390 V2R8	**Deleted:** This command is no longer supported because NetSpool automatically picks up changes to printer definitions in the Printer Inventory.	Printer Inventory
RELOAD	OS/390 V2R8	**Deleted:** This command is no longer supported because NetSpool automatically picks up changes to printer definitions in the Printer Inventory.	Printer Inventory
LUNAME ADD	OS/390 V2R8	**Updated:** The operator no longer needs to use this command to start a NetSpool printer LU that is newly defined to NetSpool because NetSpool can automatically start the printer. This command needs to be used only to start a printer not in a started class.	Printer Inventory

SMF Type 6 Record

Table 26 identifies changes to the SMF type 6 record that IP PrintWay writes. Refer to *z/OS Infoprint Server Operation and Administration* for detailed information about this record.

Table 26. Summary of Changes to SMF Type 6 Record

Field Name	Release	Description	Related Support
SMF6JBN	z/OS V1R2[1]	**Updated:** In the two SMF records that IP PrintWay writes for a sysout data set when the resubmit for filtering function is used, this field contains the job name of the original sysout data set.	IP PrintWay Resubmit for Filtering Enhancements

Table 26. Summary of Changes to SMF Type 6 Record (continued)

Field Name	Release	Description	Related Support
SMF6USID	z/OS V1R2[1]	**Updated:** In the two SMF records that IP PrintWay writes for a sysout data set when the resubmit for filtering function is used, this field contains the user ID of the job submitter of the original sysout data set.	IP PrintWay Resubmit for Filtering Enhancements

1. This change has been rolled back to OS/390 V2R8 and later releases.

Startup and Shutdown Procedures

Table 27 identifies changes to the NetSpool startup procedure; Table 28 on page 134 identifies changes to the IP PrintWay startup procedure; and Table 29 on page 134 identifies changes to the procedures that start and stop Infoprint Server daemons. Refer to *z/OS Infoprint Server Customization* for detailed information about these startup and shutdown procedures.

Table 27. Summary of Changes to NetSpool Startup Procedure

JCL Statement Name	Release	Description	Related Support
EXEC	OS/390 V2R8	• **New:** The INV parameter is required to identify the Printer Inventory Manager. • **Deleted:** The WTOR parameter is no longer allowed because NetSpool no longer issues a WTOR for entering operator commands. • **Deleted:** The PCDS parameter is no longer allowed because NetSpool no longer supports the print-characteristics data set and the IP PrintWay routing and options data sets.	Printer Inventory and NetSpool Operator Command Enhancements
DD	OS/390 V2R8	**Deleted:** The APIPRTCH, ANFROUTG, and ANFOPTNS DD statements are ignored because NetSpool now uses the Printer Inventory instead of the print-characteristics data set or the IP PrintWay routing and options data sets.	Printer Inventory
OUTPUT	OS/390 V2R8	**Deleted:** OUTPUT statements are ignored because the administrator can now specify all output parameters in the printer definition. Instead of concatenating OUTPUT statements to broadcast data to multiple printers, the administrator now creates a printer pool definition in the Printer Inventory.	NetSpool Dynamic Allocation Enhancement
STEPLIB	z/OS V1R2	**Updated:** The STEPLIB statement is required to specify the LE and C^{++} run-time libraries if these libraries are not in the system LNKLST.	NetSpool PCL Conversion

Interface Changes

Table 28. Summary of Changes to the IP PrintWay Startup Procedure

JCL Statement Name	Release	Description	Related Support
EXEC	OS/390 V2R8	• **New:** The INV parameter is required to identify the Printer Inventory Manager. • **Deleted:** The PARM parameter ignores parameters for hiperspace blocks, TCP/IP name, tracing, and language for messages. Instead, these values must be specified in an FSS definition in the Printer Inventory.	Printer Inventory and IP PrintWay Startup Enhancements
DD	OS/390 V2R8	• **New:** The STDENV DD statement is required if you use the IP PrintWay IPP client and Infoprint Server files are not installed in default directories. • **Deleted:** The ANFROUTG and ANFOPTNS DD statements are ignored because the Printer Inventory replaces the routing and options data sets. • **Deleted:** The SANFLOAD, SCEERUN, and SEZALINK data sets are no longer required in the STEPLIB DD statement; however, if you have not added the CEE.SCEERUN data set to the system LNKLIST, then you must add it to the STEPLIB DD statement. • **Deleted:** The ANFLIB and ANFCALL DD statements are ignored if specified because the IPP client in IP PrintWay no longer requires Java. (PTF UW74452 removed the requirement for Java.)	Printer Inventory and IP PrintWay VTAM Printer Support
CNTL, PRINTDEV, ENDCNTL	OS/390 V2R8	**Deleted:** These statements are ignored. Instead, the administrator can specify tracing parameters in an FSA definition in the Printer Inventory.	IP PrintWay Startup Enhancements

Table 29. Summary of Changes to Infoprint Server Startup and Shutdown Procedures

Procedure Name	Release	Description	Related Support
AOPSTART	OS/390 V2R8	**New:** This procedure starts Infoprint Server daemons.	Printer Inventory
	z/OS V1R2	**Updated:** You can now specify some environment variables in the STDENV DD statement.	AOPSTART and AOPSTOP Procedure Enhancements
AOPSTOP	OS/390 V2R8	**New:** This procedure stops Infoprint Server daemons.	Printer Inventory
	z/OS V1R2	**Updated:** The **–d** option lets you stop selected daemons.	AOPSTART and AOPSTOP Procedure Enhancements
	z/OS V1R2	**Updated:** The **-d subd** option lets you stop the Print Interface subsystem daemon.	Print Interface Subsystem for Batch Applications

SYS1.MACLIB Members

Table 31 on page 135 identifies changes to macros in SYS1.MACLIB. Refer to *z/OS Infoprint Server Customization* for information about the members in this table.

Table 31. Summary of Changes to SYS1.MACLIB

Macro Name	Release	Description	Related Support
ANFUEXTP	OS/390 and z/OS V1R2	**Updated:** This IP PrintWay macro contains fields that are input to IP PrintWay exits. Exits can also update fields in this macro. See "Exits" on page 113 for information about the new and updated fields for OS/390 and z/OS V1R2.	
ANFGPWFL	OS/390 V2R8	**Deleted:** This IP PrintWay macro is obsolete. It was previously used to create entries in the IP PrintWay routing and options data sets	Printer Inventory
APIPPDPF	OS/390 V2R8	**Deleted:** This NetSpool macro is obsolete. It was previously used to create a page-format table.	Printer Inventory
APIPPEFM	OS/390 V2R8	**Deleted:** This NetSpool macro is obsolete. It was previously used to create an end-of-file rules table.	Printer Inventory
APIPPP1X2	z/OS V1R2	**Updated:** The new S2FLAGS field identifies the LU type of the VTAM session and the type of output data stream (line or PCL data stream).	NetSpool Exit Enhancements

SYS1.PROCLIB Members

Table 32 identifies changes to the JCL procedures provided by Infoprint Server in SYS1.PROCLIB. Refer to *z/OS Infoprint Server Customization* for detailed information about these procedures.

Table 32. Summary of Changes to SYS1.PROCLIB

Procedure Name	Release	Description	Related Support
ANFWPROC	OS/390 V2R8	**Updated:** This sample IP PrintWay startup procedure shows the new format of the startup procedure.	Printer Inventory
AOPPRINT	OS/390 V2R8	**New:** This procedure lets users submit a batch job to print UNIX and MVS data sets and use functions provided by Print Interface.	Print Interface AOPPRINT JCL Procedure
AOPSTART	OS/390 V2R8	**New:** This procedure starts Infoprint Server daemons.	Printer Inventory
	z/OS V1R2	**Updated:** You can now specify some environment variables in the STDENV DD statement.	AOPSTART and AOPSTOP Procedure Enhancements
AOPSTOP	OS/390 V2R8	**New:** This procedure stops Infoprint Server daemons.	Printer Inventory
	z/OS V1R2	**Updated:** You can now specify options to stop selected daemons.	AOPSTART and AOPSTOP Procedure Enhancements
APIJPJCL	OS/390 V2R8	**Updated:** This sample NetSpool startup procedure shows the new format of the startup procedure.	Printer Inventory, "NetSpool Dynamic Allocation Enhancement" on page 87

SYS1.SAMPLIB Members

Table 33 on page 136 identifies the members in SYS1.SAMPLIB that are new and changed. Refer to *z/OS Infoprint Server Customization* for information about the members in this table.

Interface Changes

In OS/390 V2R8, sample IP PrintWay jobs were moved from ANF.SANFSAMP to SYS1.SAMPLIB, and sample NetSpool jobs were moved from API.SAPISAMP to SYS1.SAMPLIB. These sample jobs are not listed in this table unless they were updated in a later release.

Table 33. Summary of Changes to SYS1.SAMPLIB

Member Name	Release	Description	Related Support
ANFQINIT	OS/390 V2R8	**New:** Sample JCL to create and initialize the IP PrintWay transmission-queue data set.	Printer Inventory
ANFUXRT2	OS/390 V2R8	**New:** Sample IP PrintWay Routing exit that changes an IP address to a URL.	IP PrintWay IPP Client
ANFUXRT3	OS/390 V2R8	**New:** Sample IP PrintWay Routing exit that changes the IP address and changes a print queue name to a port number.	None.
ANFUXRT4	OS/390 V2R8	**New:** Sample IP PrintWay Routing exit that changes a printer definition name to CLASS, DEST, and FORMS values.	Printer Inventory
ANFUXBD3	OS/390 V2R8	**New:** Sample IP PrintWay Begin Data Set exit that prints a banner page before the first data set in a job.	None.
AOPCPETC	z/OS V1R2	**New:** This file copies all of the Infoprint Server sample configuration files to a directory where you can edit them.	Sample Customization Files
AOPJAUTH	OS/390 V2R8	**New:** This procedure APF-authorizes Java® libraries required by the Print Interface IPP server.	Print Interface IPP Server
AOPMIGRT	OS/390 V2R8	**New:** Sample JCL for running the migration program to migrate NetSpool, IP PrintWay, and Print Interface printer information; this procedure uses the AOPBATCH utility.	Printer Inventory
AOPMIGRX	OS/390 V2R8	**New:** Sample JCL for running the migration program to migrate PSF customization information; this procedure uses the AOPBATCH utility.	Printer Inventory
AOPPIDU	OS/390 V2R8	**New:** Sample JCL for running the Printer Inventory Definition Utility (PIDU) program using the AOPBATCH utility.	Printer Inventory
AOPRACF	z/OS V1R2	**New:** This file contains all the RACF commands required to customize the security function in Infoprint Server.	Sample Customization Files
AOXCF30J	OS/390 V2R8	**New:** Sample JCL for running AOXCF30, a font-scaling program provided by Infoprint Server Transforms with the AFP to PCL, AFP to PDF, and AFP to PostScript transforms.	AFP to PCL, AFP to PDF, and AFP to PostScript Transforms
AOXFONTS	OS/390 V2R8	**New:** Sample font-mapping table provided by Infoprint Server Transforms with the AFP to PCL, AFP to PDF, and AFP to PostScript transform features. This table is the same as the internal font-mapping table used by each transform.	AFP to PCL, AFP to PDF, and AFP to PostScript Transforms
AOX2PCLJ	OS/390 V2R8	**New:** Usermod to replace font-mapping table in the AFP to PCL transform.	AFP to PCL, AFP to PDF, and AFP to PostScript Transforms

Table 33. Summary of Changes to SYS1.SAMPLIB (continued)

Member Name	Release	Description	Related Support
AOX2PDFJ	OS/390 V2R8	**New:** Usermod to replace font-mapping table in the AFP to PDF transform.	AFP to PCL, AFP to PDF, and AFP to PostScript Transforms
AOX2PSJ	OS/390 V2R8	**New:** Usermod to replace font-mapping table in the AFP to PostScript transform.	AFP to PCL, AFP to PDF, and AFP to PostScript Transforms
APIJPTD1	z/OS V1R2	**Updated:** This sample Beginning of File exit for SCS data now determines the type of output data stream (line or PCL data stream) and performs different functions for each type.	NetSpool Exit Enhancements
APIJPTD2	z/OS V1R2	**Updated:** This sample Transparent Data exit for SCS data now determines the type of output data stream (line or PCL data stream) and performs different functions for each type.	NetSpool Exit Enhancements
APIJUBF3	z/OS V1R2	**New:** Sample Beginning of File exit for 3270 data streams.	NetSpool Exit Enhancements
APIJUGEX	z/OS V1R2	**New:** Sample NetSpool Graphic Escape exit.	NetSpool Exit Enhancements

TSO Logon Procedure

Table 34 identifies changes to the TSO logon procedure for Infoprint Server in OS/390 V2R8. Refer to *z/OS Infoprint Server Customization* for detailed information about the logon procedure.

Table 34. Summary of Changes to TSO Logon Procedure

DD Statement Name	Release	Description	Related Support
ISPMLIB	OS/390 V2R8	• **Updated:** To use Infoprint Server ISPF panels, concatenate one of the following libraries: AOP.SAOPMENU (English), AOP.SAOPMJPN (Japanese), or AOP.SAOPMESP (Spanish). Previously, these libraries were required only to use Print Interface ISPF panels, but not to use IP PrintWay panels. • **Deleted:** Libraries ANF.SANFPLIB, ANF.SANFPJPN, and ANF.SANFPESP are obsolete.	Printer Inventory
	z/OS V1R2	• **Deleted:** The AOP.SAOPMESP (Spanish) library has been removed. Infoprint Server ISPF messages are no longer available in Spanish.	

Interface Changes

Table 34. Summary of Changes to TSO Logon Procedure (continued)

DD Statement Name	Release	Description	Related Support
ISPPLIB	OS/390 V2R8	• **Updated:** One of the following libraries must be concatenated: AOP.SAOPPENU (English), AOP.SAOPPJPN (Japanese), AOP.SAOPPESP (Spanish). Previously, these libraries were required only to use Print Interface ISPF panels, but not to use IP PrintWay panels. • **Deleted:** Libraries ANF.SANFPLIB, ANF.SANFPJPN, and ANF.SANFPESP are obsolete.	Printer Inventory
	z/OS V1R2	• **Deleted:** The AOP.SAOPPESP (Spanish) library has been removed. Infoprint Server ISPF panels are no longer available in Spanish.	
ISPMALT	OS/390 V2R8	**Deleted:** Library ANF.SANFMJPN is obsolete.	Printer Inventory
ISPPALT	OS/390 V2R8	**Deleted:** Library ANF.SANFPJPN is obsolete.	Printer Inventory
SYSEXEC	OS/390 V2R8	• **Deleted:** Library ANF.SANFEXEC is obsolete. • **Updated:** Library AOP.SAOPEXEC must be concatenated.	Printer Inventory

/usr/lpp/Printsrv/samples/ Directory

Table 35 identifies the new and changed files in the **/usr/lpp/Printsrv/samples/** directory. Refer to *z/OS Infoprint Server Customization* for detailed information about these files.

Table 35. Summary of Changes to /usr/lpp/Printsrv/samples/ Directory

File Name	Release	Description	Related Support
aopapi.h	OS/390 V2R8	**New:** Header file for application programming interface (API) functions	Print Interface API
aopd.conf	OS/390 V2R8	**Updated:** A sample Infoprint Server configuration file, updated to show the new statements.	Printer Inventory, Print Interface IPP Server, SNMP Subagent, Transforms
aoprform.conf	z/OS V1R2[1]	**New:** A configuration file required by the Print Interface remote transform function. You do not need to edit this file.	Print Interface Remote Transform Support for IBM Infoprint Color 130 Plus Printer
aopsapd.conf	OS/390 V2R8	**New:** A sample SAP Callback daemon configuration file.	Transforms, Print Interface SAP Output Management System
aopxfd.conf	OS/390 V2R8	**New:** A sample transform configuration file.	Transforms, AFP to PCL, AFP to PDF, and AFP to PostScript Transforms
infoprint.oms	OS/390 V2R8	**New:** A sample file that defines one SAP ROMS and two SAP LOMSs.	Transforms, Print Interface SAP Output Management System

Table 35. Summary of Changes to /usr/lpp/Printsrv/samples/ Directory (continued)

File Name	Release	Description	Related Support
sample.pidl	OS/390 V2R8	**New:** Sample input to the Printer Inventory Definition Utility (PIDU).	Printer Inventory

1. This change has been rolled back to OS/390 V2R8 and later releases.

z/OS UNIX Commands

Table 36 lists the changes to the z/OS UNIX commands for OS/390 V2R8. Refer to the following chapters and publications for additional information:

- Chapter 6, "Infoprint Server Migration Program" on page 141 for detailed information about the **aopmig** command
- *z/OS Infoprint Server Operation and Administration* for detailed information about the **aopstart**, **aopstop**, and **pidu** commands
- *z/OS Infoprint Server User's Guide* for detailed information about the **afp2pcl**, **afp2pdf**, **afp2ps**, **lp**, **lpstat**, **pcl2afp**, **pdf2afp**, **ps2afp**, and **sap2afp** commands

Table 36. Summary of Changes to z/OS UNIX Commands

Command Name	Release	Description	Related Support
afp2pcl	OS/390 V2R8	**New:** Transforms Advanced Function Presentation (AFP) and line data into Printer Control Language (PCL) format; provided by Infoprint Server Transforms.	AFP to PCL, AFP to PDF, and AFP to PostScript Transforms
afp2pdf	OS/390 V2R8	**New:** Transforms Advanced Function Presentation (AFP) and line data into Portable Data Format (PDF); provided by Infoprint Server Transforms.	AFP to PCL, AFP to PDF, and AFP to PostScript Transforms
afp2ps	OS/390 V2R8	**New:** Transforms Advanced Function Presentation (AFP) and line data into PostScript format; provided by Infoprint Server Transforms.	AFP to PCL, AFP to PDF, and AFP to PostScript Transforms
aopmig	OS/390 V2R8	**New:** This command migrates existing printer information used by previous releases of IP PrintWay, NetSpool, and Print Interface.	Printer Inventory
aopstart	OS/390 V2R8	**Updated:** This command starts Infoprint Server daemons configured in the Infoprint Server configuration file. If you use the default configuration file, the same daemons start as in previous releases.	Printer Inventory, Print Interface IPP Server, Transforms, SNMP Subagent
	z/OS V1R2	**Updated:** This command now is an editable REXX EXEC that contains all of the environment variables used by Infoprint Server daemons, except for the AOPTRACEON and LANG variables. It now must be owned by UID 0.	Secure Environment
aopstop	OS/390 V2R8	**Updated:** The new **-d** option lets the operator stop selected daemons.	Print Interface IPP Server, Transforms, SNMP Subagent
	z/OS V1R2	**Updated:** The **-d subd** option lets the operator stop the Print Interface subsystem daemon.	
lp	OS/390 V2R8	This command can accept some new attributes. See "Job Attributes" on page 128 for new and changed job attributes.	Print Interface lp Command Enhancements

Interface Changes

Table 36. Summary of Changes to z/OS UNIX Commands (continued)

Command Name	Release	Description	Related Support
lpstat	OS/390 V2R8	• **New:** The **purged** and **failed** states are new. • **Updated:** If IP PrintWay successfully transmitted the file to a LAN printer, **lpstat** now reports the state as **completed** instead of **processing**. • **Updated:** If IP PrintWay failed to transmit a file to a LAN printer, **lpstat** now reports the state as **failed** instead of **processing**.	Print Interface Job Status Enhancements
pcl2afp	OS/390 V2R8	**New:** Transforms Printer Control Language (PCL) files into Advanced Function Presentation (AFP) format for printing on IBM AFP printers; provided by Infoprint Server Transforms.	Transforms
pdf2afp and **ps2afp**	OS/390 V2R8	**New:** Transform PostScript or Portable Document Format (PDF) files into Advanced Function Presentation (AFP) format for printing on IBM AFP printers; provided by Infoprint Server Transforms.	Transforms
pidu	OS/390 V2R8	**New:** Creates entities in the Printer Inventory. The Infoprint Server ISPF panels provide an alternative method of creating entries.	Printer Inventory
sap2afp	OS/390 V2R8	**New:** Transforms an SAP Output Text Format (OTF) or SAP Advanced Business Application Programming (ABAP) data stream file into an Advanced Function Presentation (AFP) data stream file for printing on IBM AFP printers; provided by Infoprint Server Transforms.	Transforms

Chapter 6. Infoprint Server Migration Program

The Infoprint Server Printer Inventory provided in OS/390 V2R8 and later releases lets the administrator specify printer information required by all Infoprint Server components (Print Interface, NetSpool, IP PrintWay, Transforms, the SNMP subagent) in the same repository. This means that the administrator can define one printer definition that can be used by all Infoprint Server components. See "Printer Inventory" on page 53 for more information about the Printer Inventory, printer definitions, and the other types of entries the administrator can create.

Infoprint Server provides a migration program, **aopmig**, to help the administrator migrate existing IP PrintWay, NetSpool, and Print Interface printer information to new printer definitions, printer pool definitions, and components in the Printer Inventory introduced in OS/390 V2R8.

Note: If you already run Infoprint Server on OS/390 V2R8 or later, do *not* run the migration program when you migrate to a later release.

Migrating existing printer information is a two-step process:

1. **Run the migration program.** The migration program reads existing printer information, identifies relationships between printers, and generates printer inventory definition statements. The migration program also generates a report of its processing, which you can examine for possible error conditions.

   You can rerun the migration program as often as you want before you run the PIDU program to create the Printer Inventory, because the migration program only generates text output files and does not modify your input files or create any entries in the Printer Inventory. In most cases, you should *not* need to rerun the migration program; however you might need to rerun it if you failed to specify the correct input parameters the first time. Each time you rerun the migration program, the output files containing the printer inventory definition statements and the processing report are replaced.

2. **Run the Printer Inventory Definition Utility (PIDU) program.** The PIDU program uses the printer inventory definition statements generated by the migration program as input and creates printer definitions, components, and printer pool definitions in the Printer Inventory.

   If you want, you can create entries in the Printer Inventory *before* running the PIDU program to migrate your existing printer information; however, if you do, the PIDU program might not be able to create some entries due to duplicate entry names in the Printer Inventory.

Notes:

1. The migration program does *not* migrate configuration information in IP PrintWay startup procedures to FSS and FSA definitions in the Printer Inventory. If you currently specify the PARM parameter on the EXEC statement of an IP PrintWay startup procedure, you must create an FSS definition and possibly an FSA definition in the Printer Inventory.

2. The migration program can migrate information in PSF for OS/390 startup procedures to FSS and FSA definitions in the Printer Inventory. Refer to *PSF for OS/390 & z/OS: Customization* for information about how to migrate PSF information.

Table 37 on page 142 lists the tasks that are related to running the migration program. **Required** tasks apply to all installations. **Optional** tasks apply in certain situations. For details on the procedures associated with a task, see the reference

listed.

Table 37. Summary of Migration Tasks

For Information About:	Condition	See Page:
Run the migration program.	Required	142
Inspect the report from the migration program to find possible errors.	Optional	152
Run the Printer Inventory Definition Utility (PIDU)	Required	153
If you find errors in the PIDU program or Printer Inventory, rerun the migration program and the PIDU program.	Optional	154
Edit printer definitions, components, or printer pool definitions in the Printer Inventory if necessary.	Optional	155

Running the Migration Program

The following data sets are input parameters to the migration program:
* Print Interface printer inventory files
* NetSpool print-characteristics data sets
* NetSpool end-of-file rules data sets
* NetSpool page-format data sets
* NetSpool startup procedures that contain OUTPUT statements
* IP PrintWay routing data sets
* IP PrintWay options data sets

Important Note

When you run the migration program, specify *all* **of the input data sets that your installation uses at the same time; that is, on the same aopmig command.** For example, if you run NetSpool and IP PrintWay, specify all of the NetSpool *and* all of the IP PrintWay data sets. This is because the migration program combines NetSpool, IP PrintWay, and Print Interface printer information that refers to the same printer into one new printer definition. The migration program can combine printer information *only* if you specify all input data sets that your installation uses and migrate everything at one time.

If your installation runs IP PrintWay and NetSpool on more than one system, run the migration program separately for each system. You can also run the migration program to migrate PSF for OS/390 startup procedures separately because the PSF information is not merged with printer information from Print Interface, NetSpool, or IP PrintWay.

You can run the migration program in two ways:
* From the z/OS UNIX System Services shell using the **aopmig** command
* From TSO using the AOPBATCH utility program

Preparing to Run the Migration Program

Before running the migration program, you must customize the Printer Inventory Manager because the migration program uses environment variables and

statements in the **aopd.conf** configuration file. Refer to *z/OS Infoprint Server Customization* for information about how to customize the Printer Inventory Manager.

When you run the migration program, NetSpool, IP PrintWay, and Infoprint Server daemons can be running on your z/OS system; however, this is not necessary. NetSpool and IP PrintWay can be running on other MVS, OS/390, or z/OS systems and sharing the NetSpool and IP PrintWay data sets that are input to the migration program.

Table 13 on page 112 summarizes the information that you must collect before running the migration program. This table also names the option on the **aopmig** command in which you specify this information; see the descriptions of these options in "Options" on page 144 for more information and for examples of the values you need to specify. If your installation does not currently run NetSpool, IP PrintWay, or Print Interface, you do not need to collect the information related to that product.

Table 38. Summary of Information Required by the Migration Program

Required Information	aopmig Option
Name of the directory that contains the Print Interface printer inventory files.	**-n**
Name of the partitioned data set that contains the NetSpool page-format table, APIPPPFT[1]	**-d**
Name of the partitioned data set that contains the NetSpool end-of-file rules table, APIPPEFT[1]	**-e**
Name of the data set that contains the NetSpool startup procedure (required if the startup procedure contains OUTPUT statements)[1]	**-j**
Name of the NetSpool print-characteristics data set[1]	**-p**
Name of the IP PrintWay routing data set[1]	**-r**
Name of the IP PrintWay options data set[1]	**-o**
Default class name that JES assigns to SYSOUT data sets[2]	**-c**
Default forms name that JES assigns to SYSOUT data sets [2]	**-f**
Default dest name that JES assigns to SYSOUT data sets [2]	**-t**

1. If your installation runs multiple instances of NetSpool or IP PrintWay on the same system or uses multiple input data sets of the same type, you must specify the names of all data sets. See "Migrating Multiple NetSpool and IP PrintWay Data Sets" on page 147 for information.
2. The default class, dest, and forms values are *not* required if you currently run *only* IP PrintWay. Also, if your installation defines more than one default class, dest, or forms value to JES, you must specify all default values. See "Specifying Multiple JES Default Values" on page 148 for information.

Running the Migration Program Using the aopmig Command

Format
aopmig [**-hs?**] [**-c** *default_class*]... [**-d** '*NetSpool_page_format_dataset*']...
        [**-e** '*NetSpool_EOF_rules_dataset*']... [**-f** *default_forms*]...
        [**-i** '*JES_initialization_dataset*']... [**-j** '*NetSpool_OUTPUT_JCL_dataset*']...
        [**-n** *Print_Interface_printers*] [**-o** '*IP_PrintWay_options_dataset*']...
        [**-p** '*NetSpool_PCDS*']... [**-r** '*IP_PrintWay_routing_dataset*']...
        [**-t** *default_dest*]... [**-x** '*PSF_procedure_dataset*']...

Description
aopmig reads existing printer information, identifies relationships between printers, and generates printer inventory definition statements that the Printer Inventory Definition Utility (PIDU) program can use to create printer definitions and components in the Printer Inventory.

Note: The migration program writes the inventory definition statements it generates to its **stdout** file. It writes a report of its processing to its **stderr** file. By default, both **stdout** and **stderr** are directed to the terminal. Therefore, in most cases, you should redirect **stdout** and **stderr** to UNIX files using the UNIX redirection symbols (> for **stdout** and 2> for **stderr**). See the examples in "Examples" on page 149 for examples that show how to use these redirection symbols.

Options
-c *default_class*
        The default output class that JES assigns to sysout data sets. Specify the default output class that JES assigns to sysout data sets on the system where NetSpool or Print Interface currently run; in JES2 systems, the default class is typically A. In matching NetSpool and Print Interface printer definitions with IP PrintWay routing entries, the migration program treats printer definitions that lack a class value as though they contain this default value.

        This option is not required; however, IBM strongly recommends that you specify this option if you run either NetSpool or Print Interface and some of the NetSpool and Print Interface printer definitions do not contain a class value. You can specify this option and value more than once; see "Specifying Multiple JES Default Values" on page 148 for more information.

        Example: `-c A`

-d '*NetSpool_page_format_dataset*'
        The name of the partitioned data set that contains the NetSpool page-format table. Enclose the data set name in single quotation marks if the name contains characters (such as **#** or **$**) that might be interpreted by the shell. If your installation has not created its own page-format table, specify the data set that contains the NetSpool load modules. If your installation has created its own page-format table, the table must be assembled and link edited.

        This option is not required; however IBM recommends that you specify this option if you run NetSpool. You can specify this option and value more than once; see "Migrating Multiple NetSpool and IP PrintWay Data Sets" on page 147 for more information.

        Note: Do not specify the member name. The migration program, like NetSpool, always uses the member named APIPPPFT.

Example: `-d 'API.SAPIMOD1'`

-e '*NetSpool_EOF_rules_dataset*'

The name of the partitioned data set that contains the NetSpool end-of-file rules table. Enclose the data set name in single quotation marks if the name contains characters (such as **#** or **$**) that might be interpreted by the shell. If your installation has not created its own end-of-file rules table, specify the data set that contains the NetSpool load modules. If your installation has created its own end-of-file rules table, the table must be assembled and link edited.

This option is not required; however IBM recommends that you specify this option if you run NetSpool. You can specify this option and value more than once; see "Migrating Multiple NetSpool and IP PrintWay Data Sets" on page 147 for more information.

Note: Do *not* specify the member name. The migration program, like NetSpool, always uses the member named APIPPEFT.

Example: `-e 'API.SAPIMOD1'`

-f *default_forms*

The default forms name that JES assigns to sysout data sets. Your installation defines this value to JES during initialization. Specify the default forms name that JES assigns to sysout data sets on the system where NetSpool and Print Interface currently run. In matching NetSpool and Print Interface printer definitions with IP PrintWay routing entries, the migration program treats printer definitions that lack a forms value as though they contain this default value.

This option is not required; however, IBM strongly recommends that you specify this option if you run either NetSpool or Print Interface and some of the NetSpool and Print Interface printer definitions do not contain a forms value. You can specify this option and value more than once; see "Specifying Multiple JES Default Values" on page 148 for more information.

Example: `-f STD`

-h Requests that **aopmig** display the format of the **aopmig** command. Specify this option *by itself*, without specifying any other options.

-j '*NetSpool_OUTPUT_JCL_dataset*'

The name of the data set that contains NetSpool OUTPUT statements. Enclose the data set name in single quotation marks if the name contains characters (such as **#**, **(**, **)**, or **$**) that might be interpreted by the shell.

This option is not required; however, IBM recommends that you specify this option if you run NetSpool and your NetSpool startup procedure contains OUTPUT JCL statements. You can specify this option and value more than once; see "Migrating Multiple NetSpool and IP PrintWay Data Sets" on page 147 for more information.

Example: `-j 'SYS1.PROCLIB(APIJPJCL)'`

-i '*JES_initialization_dataset*'

The name of the data set that contains JES initialization statements for PSF for OS/390. Refer to *PSF for OS/390 & z/OS: Customization* for information about this option.

-n *Print_Interface_printers*

The name of the directory in which Print Interface printer definitions are

stored. If you installed Print Interface in the default directory, specify **/var/Printsrv/printers**. The value you specify for this option is case sensitive.

This option is not required; however, IBM recommends that you specify this option if your run Print Interface.

Example: `-n /var/Printsrv/printers`

-o '*IP_PrintWay_options_dataset*'
The name of the IP PrintWay options data set. Enclose the data set name in single quotation marks if the name contains characters (such as **#** or **$**) that might be interpreted by the shell.

This option is not required; however, IBM recommends that you specify this option if you run IP PrintWay and use an IP PrintWay options data set. You can specify this option and value more than once; see "Migrating Multiple NetSpool and IP PrintWay Data Sets" on page 147 for more information.

Example: `-o 'ANF.OPTIONS'`

-p '*NetSpool_PCDS*'
The name of the NetSpool print-characteristics data set. Enclose the data set name in single quotation marks if the name contains characters (such as **#**, **(,),** or **$**) that might be interpreted by the shell.

This option is not required; however, IBM recommends that you specify this option if you run NetSpool and use a NetSpool print-characteristics data set. You can specify this option and value more than once; see "Migrating Multiple NetSpool and IP PrintWay Data Sets" on page 147 for more information.

Example: `-p 'API.PCDS'`

-r '*IP_PrintWay_routing_dataset*'
The name of the IP PrintWay routing data set. Enclose the data set name in single quotation marks if the name contains characters (such as **#** or **$**) that might be interpreted by the shell.

This option is not required; however, IBM recommends that you specify this option if you run IP PrintWay and use an IP PrintWay routing data set. You can specify this option and value more than once; see "Migrating Multiple NetSpool and IP PrintWay Data Sets" on page 147 for more information.

Example: `-r 'ANF.ROUTING'`

-s
Suppresses the merging of IP PrintWay JCL routing criteria. If you select this option, IP PrintWay creates a printer definition for each IP PrintWay routing entry in the IP PrintWay routing data set. This option applies only if you run IP PrintWay.

By default, the migration program merges IP PrintWay JCL routing criteria (DEST, CLASS, and FORMS parameters) whenever possible to create one printer definition. Each IP PrintWay routing entry contains a DEST, FORMS, and CLASS value; however, starting with OS/390 V2R8, IP PrintWay lets the administrator omit one or two of these routing criteria if the printer definition applies to sysout data sets with any value for the omitted parameters. See "IP PrintWay Extended Routing Criteria" on page 94 for more information about this enhancement.

To support this enhancement, the migration program identifies routing entries that can be combined into a single printer definition by omitting one or more of the DEST, FORMS, and CLASS parameters. The migration

program combines routing entries only if all the entries have the same contents. See the "Merge IP PrintWay Routing Criteria" section in "Using the Migration Program Report" on page 152 for an example of how the migration program merges routing entries.

-t *default_dest*

The default dest name that JES assigns to sysout data sets. Your installation defines this value to JES during initialization. Specify the dest name that JES assigns to sysout data sets on the system where NetSpool or Print Interface currently run. In matching NetSpool and Print Interface printer definitions with IP PrintWay routing entries, the migration program treats printer definitions that lack a dest value as though they contain this default value.

This option is not required; however, IBM strongly recommends that you specify this option if you run either NetSpool or Print Interface and some of the NetSpool and Print Interface printer definitions do not contain a dest value. You can specify this option and value more than once; see "Specifying Multiple JES Default Values" on page 148 for more information.

Example: `-t LOCAL`

-x '*PSF_procedure_dataset*'

The name of the data set that contains the PSF startup procedure. Refer to *PSF for OS/390 & z/OS: Customization* for information about this option.

-?   Requests that **aopmig** display the format of the **aopmig** command. This option is equivalent to the **-h** option. Specify this option *by itself*, without specifying any other options.

Migrating Multiple NetSpool and IP PrintWay Data Sets

If your installation runs multiple instances of NetSpool or IP PrintWay on the same system and uses multiple NetSpool or IP PrintWay input data sets of the same type, you must specify all input data sets to the migration program with the same **aopmig** command. You must specify the NetSpool input data sets that belong together as a set; and you must specify the IP PrintWay input data sets that belong together as a set. The following examples show how to migrate multiple NetSpool and IP PrintWay data sets:

- **Migrating multiple NetSpool data sets:** If you run three instances of NetSpool, and each instance uses its own print-characteristics data set, its own OUTPUT JCL statements, and its own end-of-file rules table, repeat the **-p**, **-j**, and **-e** options and values as a set. In this example, all instances of NetSpool share the same page-format table; therefore, that input data set is specified only one time. You could instead repeat the **-d** option and value three times.

  This example also specifies the default class, dest, and forms values. If your installation defines more than one default class, dest, or forms to JES, repeat the default values as a set, as shown.

  ```
  aopmig -p API.PCDS1 -j 'SYS1.PROCLIB(NET1)' -e USER.LIB1 \
         -p API.PCDS2 -j 'SYS1.PROCLIB(NET2)' -e USER.LIB2 \
         -p API.PCDS3 -j 'SYS1.PROCLIB(NET3)' -e USER.LIB3 \
         -d API.SAPIMOD1 \
         -c A -t LOCAL -f STD1 -c A -t LOCAL -f STD2 \
          >aopmig.invdefs 2>aopmig.report
  ```

- **Migrating Multiple IP PrintWay Data Sets:** If you run two instances of IP PrintWay, and each instance uses its own routing data set and options data set, repeat the **-r** and **-o** options as a set.

  ```
  aopmig -r ANF.ROUTING1 -o ANF.OPTIONS1 \
         -r ANF.ROUTING2 -o ANF.OPTIONS2 \
          >aopmig.invdefs 2>aopmig.report
  ```

- **Migrating Multiple NetSpool and IP PrintWay Data Sets:** If you run two instances of NetSpool and IP PrintWay, and each instance uses its own IP PrintWay routing data set, IP PrintWay options data set, NetSpool OUTPUT JCL statements, and NetSpool end-of-file rules table, repeat the **-r**, **-o**, **-j**, and **-e** options and values as a set. In this example, both instances of NetSpool share the same page-format table; therefore, this input data set is specified only one time. You could repeat the **-d** option and value two times.

```
aopmig -r ANF.ROUTING1 -o ANF.OPTIONS1 -j 'SYS1.PROCLIB(NET1)' -e USER.LIB1\
       -r ANF.ROUTING2 -o ANF.OPTIONS2 -j 'SYS1.PROCLIB(NET2)' -e USER.LIB2\
       -d API.SAPIMOD1 \
        >aopmig.invdefs 2>aopmig.report
```

When you migrate multiple data sets of the same type, it is possible for the migration program to encounter multiple entities with the same name. The migration program handles identically named entities as follows:

- It ignores duplicate entities, that is, entities that have the same name (or the same routing key) and identical contents.
- For NetSpool printer definitions and IP PrintWay routing entries that have different contents, it accepts the first instance of the entity and ignores the rest.
- For NetSpool end-of-file and page-format entries and for NetSpool OUTPUT JCL statements, the migration program assigns a new name to each unique version of the entity and updates all references to those entities.
- For IP PrintWay options entries, the migration program retains the first instance of each entry to satisfy references to it using the PRTOPTNS JCL parameter. For each unique version of an options entry with the same name, the migration program assigns a new name and updates all references to the options entry.

Specifying Multiple JES Default Values
If you are migrating from NetSpool or Print Interface and your installation defines more than one default class, dest, or forms value to JES, you must specify all of the default values to the migration program. To do this, repeat the **-c**, **-t**, and **-f** options and values as a set, as shown in the following example:

```
aopmig -p API.PCDS1 -j 'SYS1.PROCLIB(NET1)' -e USER.LIB1 -d API.SAPIMOD1 \
       -c A -t LOCAL -f STD1 \
       -c A -t LOCAL -f STD2 \
        >aopmig.invdefs 2>aopmig.report
```

Usage Notes
- If you run the **aopmig** command from the OMVS shell and do not have room to type all of the required command options on the command line, do one of the following:
  - Use **rlogin** to log into the z/OS UNIX System Services shell from a platform, such as UNIX, that supports the **rlogin** function. Either type the entire **aopmig** command on the same command line, or type the backslash character to continue the **aopmig** command on the next line as shown in "Examples" on page 149. Do *not* type any blank spaces or other characters after the backslash.
  - Create and execute a shell script that contains the **aopmig** command and options. For information about how to create a shell script, refer to *z/OS UNIX System Services User's Guide*. The basic steps for creating a shell script are:
    1. Use the OEDIT command or another method to create a UNIX file. In this file, specify the **aopmig** command and options. To continue options on the next line, type the backslash character; do *not* type any blank spaces or other characters after the backslash. The **aopmig** command and options

are case sensitive, so be sure to type the correct uppercase and lowercase characters. Enter the **aopmig** command and options as shown in "Examples".

2. Use the **chmod** command to set read and execute permissions for the file. Only the owner of the file can set permissions. For example, if the shell script name is **aopmig.command**, enter on the OMVS command line::

   ```
   chmod a+rx aopmig.command
   ```

3. Execute the shell script from the OMVS command line. For example, if the shell script name is **aopmig.command**, enter on the OMVS command line:

   ```
   aopmig.command
   ```

- The migration program uses the ASCII and EBCDIC code pages specified in the Infoprint Server configuration file (**aopd.conf**) when it migrates NetSpool or IP PrintWay printer information. If the standard default code pages are not suitable for your installation, specify the desired code pages in this file. Refer to *z/OS Infoprint Server Customization* for detailed information about the configuration file.

- You can rerun the migration program as often as you want *before* you run the PIDU program to create the Printer Inventory, because the migration program only generates text output files and does not modify input files or create any entries in the Printer Inventory. Each time you run the migration program, it replaces the inventory definition statements and the report of its processing.

- The migration program writes the inventory definition statements it generates to its **stdout** file. It writes its report to its **stderr** file. Because both **stdout** and **stderr** are directed to the terminal by default, in most cases, you should redirect **stdout** and **stderr** output to file using the UNIX redirection symbols (> for **stdout** and 2> for **stderr**. See "Examples" for examples of how to do this.

- Save the **stdout** file from the migration program until you are satisfied with the entries in the Printer Inventory. You might need to edit the file if you need to rerun the migration program. See "Rerunning the Migration Program and the PIDU Program" on page 154 for more information.

Examples

This section shows how to enter the **aopmig** command to migrate Print Interface, NetSpool, and IP PrintWay data sets. You can enter these commands from the z/OS UNIX System Services shell or type them into a shell script.

The backslash character indicates that the **aopmig** command continues on the next line; do *not* type any spaces or other characters after the backslash. If you logged into z/OS UNIX System Services using the OMVS command, you cannot continue the **aopmig** command on another line. In this case, either use **rlogin** to log into z/OS UNIX System Services or create a shell script as described in "Usage Notes" on page 148.

For additional examples, see "Migrating Multiple NetSpool and IP PrintWay Data Sets" on page 147 and "Specifying Multiple JES Default Values" on page 148.

Migrating from Print Interface: Enter the following command to migrate the Print Interface printer inventory files in the **/var/Printsrv/printers** directory:

```
aopmig -n /var/Printsrv/printers >aopmig.invdefs 2>aopmig.report
```

Migrating from NetSpool: Enter the following command to migrate these data sets and tables:

- NetSpool print-characteristics data set API.PCDS
- NetSpool page-format table in API.SAPIMOD1
- NetSpool end-of-file rules table in USER.LIB
- Output statements in NetSpool startup procedure NETSPOOL in SYS1.PROCLIB

The **-c**, **-f**, and **-t** options specify the default class, forms, and dest values for the installation.

```
aopmig -p API.PCDS -d API.SAPIMOD1 -e USER.LIB -j 'SYS1.PROCLIB(NETSPOOL)' \
        -c A -t LOCAL -f STD1 >aopmig.invdefs 2>aopmig.report
```

Migrating from IP PrintWay: Enter the following command to migrate these data sets:

- IP PrintWay routing data set ANF.ROUTING
- IP PrintWay options data set ANF.OPTIONS

```
aopmig -r ANF.ROUTING -o ANF.OPTIONS >aopmig.invdefs 2>aopmig.report
```

Migrating from Print Interface, NetSpool, and IP PrintWay: Enter the following command to migrate these data sets and tables:

- Print Interface printer inventory in the **/var/Printsrv/printers** directory
- NetSpool print-characteristics data set API.PCDS; if your installation has defined NetSpool printers in the IP PrintWay routing and options data set, omit the **-p** option that specifies this data set.
- IP PrintWay routing data set ANF.ROUTING
- IP PrintWay options data set ANF.OPTIONS
- NetSpool page-format table in API.SAPIMOD1
- NetSpool end-of-file rules table in USER.LIB
- Output JCL statements in NetSpool startup procedure APIJPJCL in SYS1.PROCLIB

The **-c**, **-f**, and **-t** options specify the default class, forms, and dest values for the installation.

```
aopmig -n /var/Printsrv/printers -p API.PCDS -r ANF.ROUTING -o ANF.OPTIONS \
        -d API.SAPIMOD1 -e USER.LIB -j 'SYS1.PROCLIB(APIJPJCL)' \
        -c A -f STD1 -t LOCAL  >aopmig.invdefs 2>aopmig.report
```

Environment Variables

AOPCONF   Names the Infoprint Server configuration file. This environment variable is optional; if specified, the file named in this variable takes precedence over the user-specific configuration file, **$HOME/.aopconf**, and the system default configuration file, **/etc/Printsrv/aopd.conf**.

Files

$HOME/.aopconf
            Contains the user-specific Infoprint Server configuration file. This file takes precedence over **/etc/Printsrv/aopd.conf**.

/etc/Printsrv/aopd.conf
            The default Infoprint Server configuration file. This file is optional.

Running the Migration Program from TSO

You can run the migration program from TSO using the AOPBATCH utility, which IBM recommends, or the BPXBATCH utility. If you use the AOPBATCH utility, specify the PATH environment variable; specify the LIBPATH and NLSPATH

environment variables only if your installation did not install Infoprint Server files in the default directories. If you use the BPXBATCH utility, specify the PATH, LIBPATH, and NLSPATH environment variables.

When you use either the AOPBATCH or the BPXBATCH utility, also specify the AOPCONF environment variable if you want to explicitly specify the location of the Infoprint Server configuration file. Refer to *z/OS Infoprint Server Customization* for information about how to set these environment variables.

When you use either the AOPBATCH or BPXBATCH utility, you can specify command line arguments using the PARM parameter on the EXEC statement. However, because the value for the PARM parameter cannot exceed 100 characters, in most cases you should use the environment variables shown in Table 39 to specify input parameters to the migration program.

Table 39. Environment Variables for Running the Migration Program from TSO

Environment Variable	Comparable Command Line Option
AOPMIG_DEFAULT_CLASS	**-c**
AOPMIG_NETSPOOL_PAGE_FORMAT	**-d**
AOPMIG_NETSPOOL_EOF_RULES	**-e**
AOPMIG_DEFAULT_FORMS	**-f**
AOPMIG_NETSPOOL_OUTPUT_JCL	**-j**
AOPMIG_PRINT_INTERFACE_PRINTERS	**-n**
AOPMIG_IP_PRINTWAY_OPTIONS	**-o**
AOPMIG_NETSPOOL_PCDS	**-p**
AOPMIG_IP_PRINTWAY_ROUTING	**-r**
AOPMIG_SUPPRESS_CRITERIA_MERGE	**-s**
AOPMIG_DEFAULT_DEST	**-t**

Notes:

1. These environment variables can have only one value. If you need to specify multiple input data sets for a migration program option, run the migration program from the z/OS UNIX System Services shell.

2. The value for the AOPMIG_PRINT_INTERFACE_PRINTERS environment variable is case sensitive; the values for the other environment variables are not.

IBM provides sample JCL in the AOPMIGRT member of SYS1.SAMPLIB for running the migration program using the AOPBATCH utility. Figure 1 on page 152 shows member AOPMIGRT.

```
//AOPMIGRT JOB MSGLEVEL=(1,1)
//*                                                                   *
//*  THIS JCL WILL USE THE AOPBATCH UTILITY TO RUN THE aopmig         *
//*  PROGRAM TO MIGRATE OS/390 PRINT SERVER, IP PRINTWAY,             *
//*  NETSPOOL DEFINITIONS TO INFOPRINT SERVER.                        *
//*                                                                   *
//*  REPLACE hlq AND volume WITH VALUES APPROPRIATE FOR YOUR          *
//*  SYSTEM.  DO NOT MODIFY PARM='aopmig'.  ALSO SET THE VARIABLES    *
//*  IN STDENV TO INDICATE THE DATA SET NAMES ON YOUR SYSTEM.         *
//*                                                                   *
//*********************************************************************
//*
//MIGRT    EXEC PGM=AOPBATCH,PARM='aopmig'
//*
//STDOUT   DD  DSN=hlq.INVDEFS,
//             DISP=(NEW,CATLG,DELETE),
//             DCB=(RECFM=VB,LRECL=4096),
//             UNIT=SYSALLDA,VOL=SER=volume,SPACE=(TRK,(5,15,0))
//*
//STDERR   DD  SYSOUT=*
//*
//STDENV   DD  *
PATH=/usr/lpp/Printsrv/bin:/bin:
AOPMIG_PRINT_INTERFACE_PRINTERS=/var/Printsrv/printers
AOPMIG_IP_PRINTWAY_ROUTING=ANF.ROUTING
AOPMIG_IP_PRINTWAY_OPTIONS=ANF.OPTIONS
AOPMIG_NETSPOOL_OUTPUT_JCL=API.OUTPUTS
AOPMIG_NETSPOOL_PCDS=API.PCDS
AOPMIG_NETSPOOL_EOF_RULES=API.LOADLIB
AOPMIG_NETSPOOL_PAGE_FORMAT=API.LOADLIB
/*
```

Figure 1. Sample JCL for Running the Migration Program from TSO — AOPMIGRT in SYS1.SAMPLIB

Using the Migration Program Report

The migration program writes a report of its processing to **stderr**.

You do not need to read this report; however, you might want to scan it to detect possible error conditions. Following are some hints for reading or scanning the error report:

- Try reading or scanning the report online because it can be quite large.
- To find errors found by the migration program, search for the word "Error" in the report.
- To find warnings found by the migration program, search for the word "Warning" in the report.
- Search for these sections in the report:
  - "Print Interface Printers That Did Not Match IP PrintWay"
  - "Unreferenced Components"
  - "Missing Components"

  If any of these sections contain data, it might indicate that you did not specify all of the NetSpool and Print Interface data sets used by your installation to the migration program. If this is the case, rerun the migration program and specify all input data sets.

- Search for sections entitled "Definitions That Have Identical Keys". If these sections exist and contain data, the migration program could not migrate the listed entries in the input data sets.
- Search for section "Assign Names to Nameless Infoprint Server Printers" in the report. This section lists printer definition names that the migration program generated. These names begin with the prefix "is_gen". If these names are not suitable, you can change them after you run the PIDU program to create the Printer Inventory.

See Appendix A, "Migration Report" on page 159 for a description of each section in the migration report.

Running the Printer Inventory Definition Utility (PIDU)

After running the migration program and reviewing the report of its processing, run the Printer Inventory Definition Utility (PIDU) program to create entries (printer definitions, components, and printer pool definitions) in the Infoprint Server Printer Inventory. Use the definition statements that the migration program generates and writes to **stdout** as input to the PIDU program.

Note: Before running the PIDU program, ensure that the Printer Inventory Manager daemon, **aopd**, is running; refer to *z/OS Infoprint Server Operation and Administration* for information about how to start the Printer Inventory Manager daemon. NetSpool, IP PrintWay, and any other Infoprint Server daemons can also be running when you run the PIDU program; however, this is not necessary.

When the Printer Inventory Manager starts, it creates the Printer Inventory files if they do not already exist. The Printer Inventory files (**master.db** and **jestoken.db**) are created in the directory you specified in the **base-directory** statement in the Infoprint Server configuration file (**/etc/Printsrv/aopd.conf**); the default directory is **/var/Printsrv**. To view or edit the Printer Inventory files, use the Infoprint Server ISPF panels or the PIDU program. Refer to *z/OS Infoprint Server Operation and Administration* for information about how to use the ISPF panels and the PIDU program.

You can run the PIDU program in two ways:
- From the z/OS UNIX System Services shell using the **pidu** command
- From TSO using the AOPBATCH utility program

Running the PIDU Program Using the pidu Command

To run the PIDU program you can enter the **pidu** command from the z/OS UNIX command line. Name the file that contains the printer inventory definition statements created by the migration program as input to the **pidu** command.

The PIDU program writes a report of errors to **stderr**. By default, **stderr** is directed to the terminal. You should redirect this output to a file using the UNIX redirection symbol (2> for **stderr**).

For example, if you entered the following command from the z/OS UNIX command line to direct the printer inventory definition statements to a file named **aopmig.invdefs**:

```
aopmig ... >aopmig.invdefs 2>aopmig.report
```

Then enter the following **pidu** command and specify the **aopmig.invdefs** file as input:

```
pidu <aopmig.invdefs 2>pidu.report
```

Running the PIDU Program from TSO

You can also run the PIDU program from TSO using the AOPBATCH utility program, which IBM recommends, or the BPXBATCH utility program. In the STDIN DD statement, you can either specify the PIDU command statements or you can name a file that contains the PIDU command statements.

If you use the AOPBATCH utility, specify the PATH environment variable; specify the LIBPATH and NLSPATH environment variables only if your installation did not install Infoprint Server files in the default directories. If you use the BPXBATCH utility, specify the PATH, LIBPATH, and NLSPATH environment variables.

When you use either the AOPBATCH or the BPXBATCH utility, also specify the AOPCONF environment variable if you want to explicitly specify the location of the configuration file. Refer to *z/OS Infoprint Server Customization* for information about how to set these environment variables.

IBM provides sample JCL in the AOPPIDU member of SYS1.SAMPLIB for running the PIDU program using the AOPBATCH utility. Figure 2 shows member AOPPIDU.

```
//AOPPIDU  JOB ,'pidu'
//*---------------------------------------------------------------
//*
//*  Sample JCL for running pidu in batch.
//*
//*  This JCL will use the AOPBATCH utility to run the pidu program
//*  to process Infoprint Server inventory definitions.
//*
//*  Replace hlq with the appropriate value.  Use the aopmigrt or
//*  aopmigrx job to create the hlq.invdefs data set.  You may edit
//*  the definitions in the data set as needed.
//*
//*  STDIN may also point to a sequential dataset containing other
//*  Printer Inventory Definition Language (PIDL) statements.
//*
//*---------------------------------------------------------------
//*
//PIDU     EXEC PGM=AOPBATCH,PARM='pidu'
//*
//STDIN    DD  DSN=hlq.INVDEFS,DISP=SHR
//*
//STDOUT   DD  SYSOUT=*
//STDERR   DD  SYSOUT=*
//*
//* STDENV may point to a dataset containing environment variables.
//*        Builtin values will work for the default installation.
//*STDENV   DD  DSN=environment,DISP=SHR
```

Figure 2. Sample JCL for Running the PIDU Program from TSO — AOPPIDU in SYS1.SAMPLIB

Rerunning the Migration Program and the PIDU Program

You can rerun the migration program as often as you want *before* you run the PIDU program to create the Printer Inventory. However, if you need to rerun the migration

program *after* you have already run the PIDU program, you must first delete the entries in the Printer Inventory that were created when you previously ran the PIDU program. To do this, follow these steps:

1. Edit the file that contains the input statements to the PIDU program. Change *all* "create" statements in this file to "delete" statements. For example, change this sample "create" statement:

```
create allocation DMJOK10
    copies = 5
  ;
```

   To this "delete" statement:

```
delete allocation DMJOK10;
```

   Also, be sure to delete all printer definitions before you delete the components that are included in the printer definitions.

   You can use the following **awk** program to create a file with "delete" statements in the correct order. If your input file is named **aopmig.invdefs**, enter these commands on the z/OS UNIX command line:

```
awk '/^create/ { print NR " " $2 " " $3 }' < aopmig.invdefs | \
sort -nr \
awk '{ print "delete " $2 " " $3 " ;" }' >delete.invdefs
```

   These commands generate a "delete" statement for each "create" statement in the input file and create output file **delete.invdefs**. Do *not* type any blank spaces or other characters after the backslashes. See "Usage Notes" on page 148 for more information about how to enter z/OS UNIX commands, and refer to *z/OS UNIX System Services Command Reference* if you want more information about the **awk** and **sort** commands.

2. Run the PIDU program using the file with the "delete" statements as the input file. This step deletes the entries from the Printer Inventory that were created when you previously ran the PIDU program, but preserves any entries that your installation might have created using the Infoprint Server ISPF panels. For example, enter:

```
pidu <delete.invdefs 2>pidu.report
```

3. Rerun the migration program **aopmig.**
4. Rerun the PIDU program.

Viewing and Editing the Printer Inventory

After running the PIDU program, you can use Infoprint Server ISPF panels to browse the new printer definitions, components, and printer pool definitions in the Printer Inventory. You can also use the ISPF panels to edit these entries if desired. If you need to make the same changes to many printer definitions, you can use the PIDU program. Refer to *z/OS Infoprint Server Operation and Administration* for information about how to use the ISPF panels and how to use the PIDU program to edit the Printer Inventory.

You might want to edit printer definitions for the following reasons:

- **Change names of printer definitions and components:** If you migrated NetSpool or IP PrintWay data sets, the migration program might have generated names for some of the new printer definitions. You might want to change the printer definition names to something more meaningful to job submitters if your installation plans to use the Print Interface component of Infoprint Server.

See report section "Assign Names to Nameless Infoprint Server Printers" in "Using the Migration Program Report" on page 152 for a description of how the migration program assigns names. For example, if the migration program migrated an IP PrintWay routing entry to a printer definition, then the name of the printer definition is the concatenation of the DEST, CLASS, and FORMS values in the routing entry.

In some cases, the migration program might have generated names for printer definitions and components that start with "is_gen", in order to avoid duplicate names in the Printer Inventory. To change these names, you can use the Infoprint Server ISPF panels to list all printer definitions or components whose names begin with "is_gen" and edit them.

- **Delete unused components:** If you migrated from NetSpool or IP PrintWay, the migration program might have created components that are not included in any printer definitions. If your migration program report contains section "Unreferenced Components", use the ISPF panels to browse the components listed in this section to see whether your installation uses them; if your installation does not use them, you can delete them from the Printer Inventory.

- **Create missing components:** If you migrated from NetSpool or IP PrintWay, and the input data sets are missing some entries, the migration program might have created printer definitions that refer to missing components. If your migration program report contains section "Missing Components", you can use the ISPF panels to create the components listed in this section.

- **Specify IP addresses for printer definitions:** If you migrated from Print Interface, the migration program might have created printer definitions that do not specify an IP address for the target IP PrintWay printer. If your migration program report contains section "Print Interface Printers That Did Not Match IP PrintWay", you can use the ISPF panels to either delete or edit the printer definitions listed in this section. If a printer definition lacks an IP address, the user must specify the IP address on the **lp** command, AOPPRINT JCL procedure, or OUTPUT JCL statement; otherwise, IP PrintWay detects an error.

- **Force IP PrintWay to use standard TCP/IP EBCDIC to ASCII translate table:** If you migrated from IP PrintWay, and your IP PrintWay options entries use the standard TCP/IP translate tables to convert data from EBCDIC to ASCII, you might see a difference in printed output. This is because IP PrintWay, starting with OS/390 V2R8, by default uses the **iconv** conversion utility to convert data from EBCDIC to ASCII.

  If the output is not suitable for your installation, you can edit the printer definitions and Processing components created by the migration program and the IP PrintWay FSS definition to force IP PrintWay to use the standard TCP/IP translate table. For information about the fields you need to specify to use a standard TCP/IP translation table, refer to *z/OS Infoprint Server Operation and Administration*.

- **Specify printer attributes for Print Interface:** If you migrated from NetSpool or IP PrintWay, and now your installation plans to use the Print Interface component of Infoprint Server, you can simply edit the printer definitions created by the migration program and specify the printer attributes used by Print Interface. For information about the printer attributes used by Print Interface, refer to *z/OS Infoprint Server Operation and Administration*.

- **Specify printer attributes for NetSpool:** If you migrated from Print Interface or IP PrintWay, and now your installation plans to use the NetSpool component of Infoprint Server, you can simply edit the printer definitions created by the migration program and specify the printer attributes used by NetSpool. For information about the printer attributes used by NetSpool, refer to *z/OS Infoprint Server Operation and Administration*.

- **Change the type of General printer definitions:** If you migrated from NetSpool, the migration program might have created printer definitions with the type "General" for printers that are controlled by PSF for OS/390. The printer definition type for a PSF printer is "PSF for OS/390"; however, the migration program did not have sufficient information to detect that these printers were PSF printers. You might want to use the Infoprint Server ISPF panels to list all General printer definitions and change the type of the PSF printers to "PSF for OS/390"; however, this is not necessary because General printer definitions contain the same set of printer attributes as PSF for OS/390 printer definitions.

Appendix A. Migration Report

The migration program writes a report of its processing to **stderr**. This report is divided into sections. Each section corresponds to a processing step that the migration program performs; the sections are written in chronological order.

The migration program includes most report sections even if the migration program had no data to process. In this case, the report section does not contain any data. The report refers to printer attributes that the migration program generates for use by the Printer Inventory Definition Utility program, for example: **lpr-restrict-ports=yes**. In most cases, the names of these printer attributes are self-explanatory.

Following is a list of the section headings in the same order as in the migration report. The sections are numbered in this publication so that you can easily find the description of a particular section in the paragraphs that follow; these heading numbers are not included in the report itself. Each section in the report begins with a line of asterisks (*); a line of dashes (-) separates entries within a section.

1. Options and Arguments Used by this Program
2. Convert IP PrintWay Options Entries (may be repeated)
3. Identically Named Definitions That Differ (optional)
4. IP PrintWay Options Entries in Converted Format
5. Convert IP PrintWay Routing Entries (may be repeated)
6. Definitions That Have Identical Keys (optional)
7. IP PrintWay Routing Entries in Converted Format
8. Convert Print Interface Printers
9. Print Interface Printers in Converted Format
10. Convert NetSpool OUTPUT Statements (may be repeated)
11. Identically Named Definitions That Differ (optional)
12. NetSpool OUTPUT Statements in Converted Format
13. Default OUTPUT Statement Names
14. Convert NetSpool Options Entries (may be repeated)
15. Identically Named Definitions That Differ (optional)
16. NetSpool Options Entries in Converted Format
17. Overrides in Converted NetSpool Options Entries
18. Convert NetSpool End-of-File Rules Entries (may be repeated)
19. Identically Named Definitions That Differ (optional)
20. NetSpool End-of-File Rules Entries in Converted Format
21. Convert NetSpool Page Format Entries (may be repeated)
22. Identically Named Definitions That Differ (optional)
23. NetSpool Page Format Entries in Converted Format
24. Convert NetSpool Routing Entries (may be repeated)
25. Definitions That Have Identical Keys (optional)
26. NetSpool Printers in Converted Format from Routing Entries
27. Convert NetSpool PCDS Definitions (may be repeated)
28. Definitions That Have Identical Keys (optional)
29. NetSpool Printers in Converted Format from PCDS
30. Modify IP PrintWay Page Height Values
31. Add lpr-restrict-ports to Maintain Current Behavior
32. Infoprint Server Components from IP PrintWay Options Entries
33. Add lpr-restrict-ports to Maintain Current Behavior
34. Adjusted IP PrintWay Routing Entries
35. Adjusted Print Interface Printers
36. Infoprint Server Components from NetSpool End-of-File Rules Entries
37. Infoprint Server Components from NetSpool Page Format Entries

38. NetSpool Printers Adjusted for Pooling
39. NetSpool Pools
40. Infoprint Server Components from NetSpool Options Entries
41. NetSpool Printers Adjusted for Pooling
42. NetSpool Pools
43. Infoprint Server Components from NetSpool OUTPUT Statements
44. Merge IP PrintWay Routing Criteria
45. Infoprint Server Printers from Print Interface and Default Routing
46. Infoprint Server Printers from NetSpool and Default Routing
47. Infoprint Server Printers from Print Interface and Routing (may be repeated)
48. Infoprint Server Printers from NetSpool and Routing (may be repeated)
49. Merge Infoprint Server Printers
50. Remove Duplicate DEST/CLASS/FORMS Routing Support
51. Infoprint Server Printers from Routing
52. Print Interface Printers That Did Not Match IP PrintWay
53. Rename Processing Components to Prevent Duplicates
54. Combine Processing Components
55. Assign Names to Nameless Infoprint Server Printers
56. Unreferenced Components
57. Missing Components

Following is a description of the contents of each section of the migration report.

1. **Options and Arguments Used by this Program**

   Reflects the specifications made when the program was invoked.

2. **Convert IP PrintWay Options Entries**

   Lists messages from the conversion of individual options entries. If you specify more than one options data set name, the migration program creates an instance of this section for each data set.

3. **Identically Named Definitions That Differ**

   The migration program includes this section only when you specify more than one options data set name. It lists options entries whose names occur in more than one input data set and whose contents differ between data sets.

   The migration program assigns a new name to each unique version of these options entries. It updates routing entries that refer to these options entries so they use the new names. Because an installation can refer to these options entries in the PRTOPTNS parameter of JCL OUTPUT statements or in Print Interface printer definitions, the migration program retains the first occurrence of the options entry using the original name.

4. **IP PrintWay Options Entries in Converted Format**

   Lists the results of the preliminary conversion. Some attribute values will subsequently be adjusted and options entries might be divided into several components.

5. **Convert IP PrintWay Routing Entries**

   Lists messages from the conversion of individual routing entries. If you specify more than one routing data set name, the migration program creates an instance of this section for each data set.

6. **Definitions That Have Identical Keys**

   The migration program includes this section only when you specify more than one routing data set name. It lists routing entries whose keys occur in more than one input data set and whose contents differ between data sets. Because there can be only one entry per key, the migration program retains the first entry for each key.

7. **IP PrintWay Routing Entries in Converted Format**

   Lists the results of the preliminary conversion. Routing entries will subsequently be combined with NetSpool and Print Interface printer definitions or used to create their own printer definitions.

8. **Convert Print Interface Printers**

   Lists messages from the conversion of individual printers.

9. **Print Interface Printers in Converted Format**

   Lists the results of the preliminary conversion. Printers might subsequently be combined with IP PrintWay routing entries and NetSpool printer definitions.

10. **Convert NetSpool OUTPUT Statements**

    Lists messages from the conversion of individual JCL OUTPUT statements. If you specify more than one data set name for JCL OUTPUT statements, the migration program creates an instance of this section for each data set.

11. **Identically Named Definitions That Differ**

    The migration program includes this section only when you specify more than one JCL OUTPUT statements data set name. It lists OUTPUT statements whose names occur in more than one input data set and whose contents differ between data sets.

    The migration program assigns a new name to each unique version of these OUTPUT statements. It updates NetSpool printers and options entries that refer to these OUTPUT statements so they use the new names.

12. **NetSpool OUTPUT Statements in Converted Format**

    Lists the results of the preliminary conversion. In subsequent steps the migration program might move some attributes from these preliminary Allocation component definitions into printer definitions.

13. **Default OUTPUT Statement Names**

    Lists the name of the default OUTPUT statement, if one exists. If you specify more than one input data set to the migration program, this section lists the name of the default OUTPUT statement in each input file.

14. **Convert NetSpool Options Entries**

    Lists messages from the conversion of individual options entries. If you specify more than one options data set name, the migration program creates an instance of this section for each data set.

15. **Identically Named Definitions That Differ**

    The migration program includes this section only when you specify more than one options data set name. It lists options entries whose names occur in more than one input data set and whose contents differ between data sets.

    The migration program assigns a new name to each unique version of these options entries. It updates NetSpool printers that refer to these options entries so they use the new names.

16. **NetSpool Options Entries in Converted Format**

    Lists the results of the preliminary conversion. Some attribute values will subsequently be adjusted. Options entries whose contents can not be mapped to a component will be used to update NetSpool printers, then discarded.

17. **Overrides in Converted NetSpool Options Entries**

    Lists options entries that include OVERRIDE specifications in the form OVERRIDE=(CLASS,DEST,FORMS).

18. **Convert NetSpool End-of-File Rules Entries**

Lists messages from the conversion of individual end-of-file rules entries. If you specify more than one end-of-file rules data set name, the migration program creates an instance of this section for each data set.

19. **Identically Named Definitions That Differ**

The migration program includes this section only when you specify more than one end-of-files rules data set name. It lists end-of-file rules entries whose names occur in more than one input data set and whose contents differ between data sets.

The migration program assigns a new name to each unique version of these end-of-file rules entries. It updates NetSpool printers that refer to these end-of-file rules entries so they use the new names.

20. **NetSpool End-of-File Rules Entries in Converted Format**

Lists the results of the preliminary conversion.

21. **Convert NetSpool Page Format Entries**

Lists messages from the conversion of individual page format entries. If you specify more than one page format data set name, the migration program creates an instance of this section for each data set.

22. **Identically Named Definitions That Differ**

The migration program includes this section only when you specify more than one page format data set name. It lists page formatting entries whose names occur in more than one input data set and whose contents differ between data sets.

The migration program assigns a new name to each unique version of these page format entries. It updates NetSpool printers that refer to these page format entries so they use the new names.

23. **NetSpool Page Format Entries in Converted Format**

Lists the results of the preliminary conversion. In subsequent steps the migration program might add code page specifications and might combine these converted page format entries with specifications from converted IP PrintWay options entries.

24. **Convert NetSpool Routing Entries**

Lists messages from the conversion of individual routing entries. If you specify more than one routing data set name, the migration program creates an instance of this section for each data set.

25. **Definitions That Have Identical Keys**

The migration program includes this section only when you specify more than one routing data set name. It lists NetSpool printer names (logical unit names) that occur in more than one input data set. Because there can be only one printer per logical unit name, the migration program retains the first entry for each name.

26. **NetSpool Printers in Converted Format from Routing Entries**

Lists the results of the preliminary conversion. Printers might subsequently be combined with IP PrintWay and Print Interface printer definitions.

27. **Convert NetSpool PCDS Definitions**

Lists messages from the conversion of individual printer definitions in the print-characteristics data set. If you specify more than one print-characteristics data set name, the migration program creates an instance of this section for each print-characteristics data set.

28. **Definitions That Have Identical Keys**

The migration program includes this section only when you specify more than one print-characteristics data set name. It lists NetSpool printer names (logical unit names) that occur in more than one input print-characteristics data set. Because there can be only one printer per logical unit name, the migration program retains the first entry for each name.

29. **NetSpool Printers in Converted Format from PCDS**

Lists the results of the preliminary conversion. Printers might subsequently be combined with IP PrintWay and Print Interface printer definitions.

30. **Modify IP PrintWay Page Height Values**

Prior to OS/390 V2R8, IP PrintWay supported the LINECOUNT, TOPMARGIN, NOTOPMARGIN, HEADER, and NOHEADER LPR options. LINECOUNT referred to the number of lines per page, not including the top margin and header. In OS/390 V2R8, IP PrintWay supports the **printway-page-height**, **printway-top-margin**, and **print-page-header** attributes. The **printway-page-height** attribute includes the top margin and header. The migration program sets these attributes so pages that IP PrintWay formats will look the same in OS/390 V2R8 as they did before.

31. **Add lpr-restrict-ports to Maintain Current Behavior**

Prior to OS/390 V2R8, the IP PrintWay LPR, by default, restricted itself to ports 721 through 731. You could specify the USERPORTS LPR option to cause the IP PrintWay LPR to use any available port.

In OS/390 V2R8, the IP PrintWay LPR uses any available port, by default. You can set the **lpr-restrict-ports** attribute to ″yes″ to cause the IP PrintWay LPR to restrict itself to ports 721 through 731. The LPD programs on some platforms, such as AIX, require the IP PrintWay LPR to restrict itself to these ports.

Because the default behavior has been reversed in OS/390 V2R8, the migration program explicitly sets the **lpr-restrict-ports** attribute so that IP PrintWay's port selection behavior for existing printers does not change. The migration program adds lpr-restrict-ports=yes to all options entries that did not include the USERPORTS LPR option.

32. **Infoprint Server Components from IP PrintWay Options Entries**

Lists OS/390 V2R8 Infoprint Server components created from IP PrintWay options entries. Each IP PrintWay options entry can result in up to three OS/390 V2R8 Infoprint Server components: IP PrintWay Options, Processing, and Protocol. All components generated from an options entry have the same name.

33. **Add lpr-restrict-ports to Maintain Current Behavior**

Prior to OS/390 V2R8, the IP PrintWay LPR restricted itself to ports 721 through 731, by default. You could specify the USERPORTS LPR option to cause the IP PrintWay LPR to use any available port.

In OS/390 V2R8, the IP PrintWay LPR uses any available port, by default. You can set the **lpr-restrict-ports** attribute to ″yes″ to cause the IP PrintWay LPR to restrict itself to ports 721 through 731. The LPD programs on some platforms, such as AIX, require the IP PrintWay LPR to restrict itself to these ports.

Because the default behavior has been reversed in OS/390 V2R8, the migration program explicitly sets the **lpr-restrict-ports** attribute so that IP PrintWay's port selection behavior for existing printers does not change. The migration program adds lpr-restrict-ports=yes to all routing entries that did not refer to an options entry. The migration program separately adjusts options entries to maintain current behavior.

34. **Adjusted IP PrintWay Routing Entries**

   Lists IP PrintWay routing entries. Routing entries that referred to an options entry now include the components generated from the options entry.

35. **Adjusted Print Interface Printers**

   Lists Print Interface printers.

36. **Infoprint Server Components from NetSpool End-of-File Rules Entries**

   Lists OS/390 V2R8 Infoprint Server NetSpool End-of-File Rules components created from NetSpool end-of-file rules entries.

37. **Infoprint Server Components from NetSpool Page Format Entries**

   Lists OS/390 V2R8 Infoprint Server Processing components created from NetSpool page format entries.

38. **NetSpool Printers Adjusted for Pooling**

   Lists NetSpool printers created from printer definitions in the NetSpool print-characteristics data set. Printer definition statements that include more than one OUTPUT statement name cause the migration program to create a printer for each OUTPUT statement name. The migration program stores the logical unit name in a pool that references all of the printers.

39. **NetSpool Pools**

   Lists NetSpool pools created from NetSpool print-characteristics data set statements. Print-characteristics data set statements that include more than one OUTPUT statement name cause the migration program to create a printer for each OUTPUT statement name. The migration program stores the logical unit name in a pool that references all of the printers.

40. **Infoprint Server Components from NetSpool Options Entries**

   Lists OS/390 V2R8 Infoprint Server NetSpool Options components created from options entries.

41. **NetSpool Printers Adjusted for Pooling**

   Lists NetSpool printers created from routing and options entries. Options entries that include more than one OUTPUT statement name cause the migration program to create a printer for each OUTPUT statement name. The migration program stores the logical unit name in a pool that references all of the printers.

42. **NetSpool Pools**

   Lists NetSpool pools created from routing and options entries. Options entries that include more than one OUTPUT statement name cause the migration program to create a printer for each OUTPUT statement name. The migration program stores the logical unit name in a pool that references all of the printers.

43. **Infoprint Server Components from NetSpool OUTPUT Statements**

   Lists OS/390 V2R8 Infoprint Server Allocation components created from NetSpool OUTPUT statements.

44. **Merge IP PrintWay Routing Criteria**

   Prior to OS/390 V2R8, IP PrintWay you had to enter values for DEST, FORMS, and CLASS in each routing entry. In OS/390 V2R8, you can leave out one or more of these parameters if the routing entry applies to SYSOUT data sets with any value for the omitted parameters.

   The migration program identifies cases where several routing entries could be reduced to a single entry by omitting one or more of the DEST, FORMS, and CLASS parameters. The migration program does so only if all of the merged entries have the same contents.

For example, if there are five routing entries:

```
DEST=PRTR1 CLASS=J FORMS=STANDARD hostname=host1 queue=queue1
DEST=PRTR1 CLASS=J FORMS=LETTER   hostname=host1 queue=queue1
DEST=PRTR1 CLASS=J FORMS=ENVELOPE hostname=host1 queue=queue1
DEST=PRTR2 CLASS=J FORMS=ENVELOPE hostname=host2 queue=queue1
DEST=PRTR3 CLASS=J FORMS=ENVELOPE hostname=host2 queue=queue2
```

where the first three entries have the same contents and no other entries exist with DEST=PRTR1 and CLASS=J, then the first three routing entries can be merged into one printer definition, with FORMS omitted in the printer definition:

```
DEST=PRTR1 CLASS=J hostname=host1 queue=queue1
```

Because the contents of the last two entries differ (queue name is different), the entries are not merged.

```
DEST=PRTR2 CLASS=J FORMS=ENVELOPE hostname=host2 queue=queue1
DEST=PRTR3 CLASS=J FORMS=ENVELOPE hostname=host2 queue=queue2
```

45. **Infoprint Server Printers from Print Interface and Default Routing**

   Lists OS/390 V2R8 Infoprint Server printers created from the combination of Print Interface printers and the IP PrintWay default routing entry. The migration program combines printers that specify a destination IP address with the default routing entry, if one exists.

46. **Infoprint Server Printers from NetSpool and Default Routing**

   Lists OS/390 V2R8 Infoprint Server printers created from the combination of NetSpool printers and the IP PrintWay default routing entry. The migration program combines printers that specify a destination IP address with the default routing entry, if one exists.

47. **Infoprint Server Printers from Print Interface and Routing**

   Lists OS/390 V2R8 Infoprint Server printers created from the combination of Print Interface printers and an IP PrintWay routing entry. The migration program matches a printer with a routing entry if the DEST, CLASS, and FORMS values in the printer are the same as those in the routing entry.

   If you specify default class, default forms, or default dest values when you start the migration program, the migration program includes an extra instance of this section for each set of default values you specify. The default class, default forms, and default dest are applied to Print Interface printers that do not include class, forms, or dest specifications.

48. **Infoprint Server Printers from NetSpool and Routing**

   Lists OS/390 V2R8 Infoprint Server printers created from the combination of NetSpool printers and an IP PrintWay routing entry. The migration program matches a printer with a routing entry if the DEST, CLASS, and FORMS values in the printer are the same as those in the routing entry.

   If you specify default class, default forms, or default dest values when you start the migration program, the migration program includes an extra instance of this section for each set of default values you specify. The default class, default forms, and default dest are applied to NetSpool printers that do not include class, forms or dest specifications.

49. **Merge Infoprint Server Printers**

   Lists OS/390 V2R8 Infoprint Server printers created from the combination of Print Interface and NetSpool printers that were both combined with the same IP PrintWay routing entry.

50. **Remove Duplicate DEST/CLASS/FORMS Routing Support**

IP PrintWay uses some OS/390 V2R8 printers to look up routing information for SYSOUT data sets that do not specify a destination IP address. It uses OS/390 V2R8 printers whose **dcf-routing** attribute equals yes.

As the migration program combines Print Interface and NetSpool printers with IP PrintWay routing entries, it sets the **dcf-routing** attribute in combinations where Print Interface and NetSpool do not override any IP PrintWay settings. However, the **destination**, **output-class**, and **forms** attributes must form a unique set in each printer whose **dcf-routing** attribute equals yes. The migration program removes the **dcf-routing** attribute from all but one printer in cases where several printers have the same **destination**, **output-class**, and **forms** attributes and have **dcf-routing** equals yes.

51. **Infoprint Server Printers from Routing**

    Some IP PrintWay routing entries have been combined with Print Interface and NetSpool printers. If Print Interface and NetSpool do not override any IP PrintWay settings, there is no need to create a separate printer with the **dcf-routing** attribute equal **yes** for IP PrintWay to use in routing SYSOUT data sets. However, the migration program must create OS/390 V2R8 printers from routing entries that could not be combined with Print Interface and NetSpool printers with **dcf-routing** equal **yes**.

52. **Print Interface Printers That Did Not Match IP PrintWay**

    Lists V2R5 Print Interface printers with type IP PrintWay but that did not match any IP PrintWay routing entries. *You should correct or remove these printers.*

53. **Rename Processing Components to Prevent Duplicates**

    The migration program can create OS/390 V2R8 Processing components from V2R5 IP PrintWay options entries. The migration program also creates OS/390 V2R8 Processing components from V2R5 NetSpool page format table entries. In cases where an option entry and a page format table entry have the same name, the migration program renames the Processing component generated from the page format table entry. The Processing component generated from the options entry might be referenced using the JCL PRTOPTNS parameter so it must not be renamed.

54. **Combine Processing Components**

    The migration program can create OS/390 V2R8 Processing components from V2R5 IP PrintWay options entries. The migration program also creates OS/390 V2R8 Processing components from V2R5 NetSpool page format table entries. In cases where the migration program creates a printer by combining a NetSpool printer with an IP PrintWay routing entry, the combined printer might need to refer to two Processing components. Since a printer can only include one Processing component, the migration program creates a new Processing component that contains information from both of the two original Processing components.

55. **Assign Names to Nameless Infoprint Server Printers**

    OS/390 V2R8 printers formed from V2R5 Print Interface printers retain the name of the V2R5 Print Interface printers. The migration program does not need to assign a name; however, OS/390 V2R8 printers formed from V2R5 NetSpool printers or V2R5 IP PrintWay routing entries don't have a name, so the migration program assigns one.

    For a printer formed from a V2R5 NetSpool printer, the migration program attempts to use the lower case representation of the printer's logical unit name. If that name is not unique, the migration program attempts to use the upper case representation of the printer's logical unit name. If that name is not unique, the migration program generates a name prefixed with ″is_gen″.

For a printer formed from a V2R5 IP PrintWay printer, the migration program attempts to use the lower case representation of the printer's DEST/CLASS/FORMS values. If that name is not unique, the migration program attempts to use the upper case representation of the printer's DEST/CLASS/FORMS values. If that name is not unique, the migration program generates a name prefixed with ″is_gen″.

56. **Unreferenced Components**

Lists components that exist but are not referenced by a printer. Unreferenced components occur because an options entry, OUTPUT statement, end-of-file rules table entry, or page format table entry was not referenced prior to migration.

IP PrintWay options entries can also be referenced in JCL using the PRTOPTNS parameter. The migration program does not consider JCL references in formulating this list.

You should decide whether the listed components are still required. If not, you can delete them.

57. **Missing Components**

Lists components that are referenced by a printer but do not exist. Missing components occur because an options entry, OUTPUT statement, end-of-file rules table entry, or page format table entry was missing prior to migration.

You should create the missing component or remove the reference to it.

Appendix B. Migration Tables

The tables in this appendix show how the migration program migrates printer information in the IP PrintWay routing data set, IP PrintWay options data set, NetSpool print-characteristics data set, NetSpool page-format table, and NetSpool OUTPUT JCL statements.

IP PrintWay Routing Data Set

The columns in Table 40 contain the following information:
- The first column lists the ISPF panel field name in an IP PrintWay routing entry.
- The second column lists the corresponding ISPF panel field name in an Infoprint Server printer definition. The ISPF panel name precedes the field name.
- The third column lists the corresponding printer attribute used by the PIDU program.

Table 40. IP PrintWay Routing Entry ISPF Fields to Infoprint Server ISPF Fields and Printer Attributes

Routing Entry Field Name	Printer Definition (or Component) Field Name	Printer Attribute (PIDU)
DEST	Allocation: DEST	destination
CLASS	Allocation: CLASS	output-class
FORMS	Allocation: FORMS	forms
Retry Time	IP PrintWay Options: Retry time	retry-time
Retry Limit	IP PrintWay Options: Retry limit	retry-limit
Retain Time Success	IP PrintWay Options: Retention period: successful	successful-retention-period
Retain Time Failure	IP PrintWay Options: Retention period: failure	failure-retention-period
Port Number	Protocol: Protocol = direct socket: Port number	port-number
Print Queue	Protocol: Protocol = lpr: Print queue name	print-queue-name
Host Name/IP Address	Protocol: Protocol = IPP: Printer IP address	printer-ip-address
Options Name	Printer Definition: Processing	include-processing
	Printer Definition: NetSpool options	include-netspool-options
	Printer Definition: IP PrintWay options	include-printway-options
	Printer Definition: Protocol	include-protocol
NetSpool Printer Name	Printer Definition: NetSpool LU name	luname
NetSpool LU Class	Printer Definition: LU classes	lu-classes
NetSpool Default Page Format Entry	Printer Definition: Processing	include-processing
NetSpool End-of-File Rules Entry	Printer Definition: NetSpool end-of-file	include-netspool-eof-rules

IP PrintWay Options Data Set

The columns in Table 41 on page 170 contain the following information:

- The first column lists the ISPF panel field name (or the keyword in the **LPR Options** field) in an IP PrintWay options entry.
- The second column lists the corresponding ISPF panel field name in an Infoprint Server printer definition. The ISPF panel name precedes the field name.
- The third column lists the corresponding printer attribute used by the PIDU program.

Table 41. IP PrintWay Options Entry ISPF Fields to Infoprint Server ISPF Fields and Printer Attributes

Options Entry Field Name	Printer Definition (or Component) Field Name	Printer Attribute (PIDU)
Exits: Record	IP PrintWay Options: Exits: Record	record-exit
Exits: Begin Data Set	IP PrintWay Options: Exits: Begin data set	begin-dataset-exit
Exits: End Data Set	IP PrintWay Options: Exits: End data set	end-dataset-exit
Trans Group: Job	IP PrintWay Options: Dataset grouping: Job	(no attributes generated)
Trans Group: Job, Concatenate	IP PrintWay Options: Dataset grouping: Concatenate job	dataset-grouping = concatenate-job
Trans Group: Data Set	IP PrintWay Options: Dataset grouping: None	dataset-grouping = none
Printer Setup Parameters	IP PrintWay Options: Document header	document-header

IP PrintWay LPR Options

BIG5	Processing: Double-byte translate table = 1 (BIG5)	db_translate_table = big5
BINARY	IP PrintWay Options: Formatting: Formatting = 1 (None)	printway-formatting = none
BURST	Protocol: Print banner page (selected)	lpr-print-banner = yes
CC	IP PrintWay Options: Formatting: Carriage control type = 3 (ANSI)	carriage-control-type = ansi
CFFIRST	Protocol: lpr Processing Options: Mode = 1 (Control file first)	lpr-mode = control-file-first
CLASS	Protocol: lpr Processing Options: Print banner page=yes: Banner class	lpr-banner-class
DELFF	IP PrintWay Options: Formatting: Delete form feed = (no entry)	delete-form-feed = both
DELFF BOTH	IP PrintWay Options: Formatting: Delete form feed = 4 (Both)	delete-form-feed = both
DELFF LEADING	IP PrintWay Options: Formatting: Delete form feed = 2 (Leading)	delete-form-feed = leading
DELFF TRAILING	IP PrintWay Options: Formatting: Delete form feed = 3 (Trailing)	delete-form-feed = trailing
EUCKANJI	Processing: Double-byte translation table = 2 (EUCKANJI)	db_translate_table = euckanji
FCB	IP PrintWay Options: Formatting: Formatting = 4 (Use FCB)	printway-formatting = use-fcb
FILTER	Protocol: Print function	lpr-print-function
HANGEUL	Processing: Double-byte translation table = 3 (HANGEUL)	db_translate_table = hangeul

Table 41. IP PrintWay Options Entry ISPF Fields to Infoprint Server ISPF Fields and Printer Attributes (continued)

Options Entry Field Name	Printer Definition (or Component) Field Name	Printer Attribute (PIDU)
HEADER	Processing: IP PrintWay Pagination: Print page header (selected)	print-page-header = yes
		printway-page-height
IBMKANJI	Processing: Double-byte translation table = 4 (IBMKANJI)	db_translate_table = ibmkanji
INDENT	Protocol: lpr Processing Options: Indent	lpr-indent
JIS78JK ASCII	Processing: Double-byte translation table = 5 (JIS78JK ASCII)	db_translate_table = jis78kj-ascii
JIS78JK JISROMAN	Processing: Double-byte translation table = 6 (JIS78JK JISROMAN)	db_translate_table = jis78kj-jisroman
JIS83JK ASCII	Processing: Double-byte translation table = 7 (JIS83JK ASCII)	db_translate_table = jis83kj-ascii
JIS83JK JISROMAN	Processing: Double-byte translation table = 8 (JIS83JK JISROMAN)	db_translate_table = jis83kj-jisroman
JOB	Protocol: lpr Processing Options: Print banner page = yes: Banner job name	lpr_banner_job_name
KSC5601	Processing: Double-byte translation table = 9 (KSC5601)	db_translate_table = ksc5601
LANDSCAPE	IP PrintWay Options: Formatting: PostScript header = 3 (Landscape)	printway-postscript = landscape
	IP PrintWay Options: Formatting: PostScript header = 4 (Always landscape)	printway-postscript = always-landscape
LINECOUNT	Processing: IP PrintWay Pagination: Pagination (selected)	printway-page-height
		printway-pagination
LINETERM	IP PrintWay Options: Formatting: Line termination	line-termination
LPDSIZE	Processing: Maximum document size	maximum-document-size
MAXSEND	Processing: Maximum document size	maximum-document-size
NAME	Protocol: lpr Processing Options: Filename	lpr-filename
NOBINARY		(no attributes generated)
NOBURST	Protocol: lpr Processing Options: Print banner page (not selected)	lpr-print-banner = no
NOCC	IP PrintWay Options: Formatting: Carriage control type = 1 (None)	carriage-control-type = none
NOEOFLF	IP PrintWay Options: Formatting: Omit line termination at EOF (selected)	omit-line-termination-at-eof = yes
NOHEADER	Processing: IP PrintWay Pagination: Print page header (not selected)	print-page-header = no
		printway-page-height
NOLINECOUNT	Processing: IP PrintWay Pagination: Pagination (not selected)	printway-pagination = suppress
NOPOSTSCRIPT	IP PrintWay Options: Formatting: PostScript header = 2 (Ignore)	printway-postscript = ignore-header

Options Entry Field Name	Printer Definition (or Component) Field Name	Printer Attribute (PIDU)
		printway-postscript = always-landscape
NOTOPMARGIN	Processing: IP PrintWay Pagination: Margins: Top (no entry)	printway-page-height printway-top-margin
POSTSCRIPT	IP PrintWay Options: Formatting: PostScript header = 1 (Add)	printway-postscript = add-header
RECORD	Protocol: lpr Processing Options: Mode = 4 (Remote PSF)	lpr-mode = to-remote-psf
SCHINESE	Processing: Double-byte translation table = 10 (SCHINESE)	db_translate_table = schinese
SJISKANJI	Processing: Double-byte translation table = 11 (SJISKANJI)	db_translate_table = sjiskanji
SOSI	Processing: IP PrintWay attributes: SOSI mode = (no entry)	printway-sosi-mode = ascii
SOSI ASCII	Processing: IP PrintWay attributes: SOSI mode = 2 (ASCII)	printway-sosi-mode = ascii
SOSI EBCDIC	Processing: IP PrintWay attributes: SOSI mode = 4 (EBCDIC)	printway-sosi-mode = ebcdic
SOSI NONE	Processing: IP PrintWay attributes: SOSI mode = 1 (None)	printway-sosi-mode = none
SOSI SPACE	Processing: IP PrintWay attributes: SOSI mode = 3 (Space)	printway-sosi-mode = space
STREAM	Protocol: lpr Processing Options: Mode = 3 (Stream)	lpr-mode = streaming
TCHINESE	Processing: Double-byte translation table = 12 (TCHINESE)	db_translate_table = tchinese
TDCHAR	IP PrintWay Options: Formatting: Transparent data character (selected)	transparent-data-character
TIMEOUT	IP PrintWay Options: Response timeout	response-timeout
TITLE	Protocol: lpr Processing Options: Title	lpr-title
TOPMARGIN	Processing: IP PrintWay Pagination: Pagination: Margins: Top	printway-page-height printway-top-margin
TRANSLATETABLE	Processing: Translation dataset qualifier	translation-dataset-qualifier
USER	Protocol: lpr Processing Options: Owner	owner
USERPORTS	Protocol: lpr Processing Options: Restrict ports (not selected)	lpr-restrict-ports = no
WIDTH	Protocol: lpr Processing Options: Width	lpr-width
XLATETABLE	Processing: Translation dataset qualifier	translation-dataset-qualifier

NetSpool Print Characteristics Data Set (PCDS)

The columns in Table 42 on page 173 contain the following information:

- The first column lists keywords in a NetSpool printer definition.

- The second column lists the corresponding ISPF panel field name in an Infoprint Server printer definition. The ISPF panel name precedes the field name.
- The third column lists the corresponding printer attribute used by the PIDU program.

Table 42. NetSpool Printer Definition Keywords to Infoprint Server ISPF Fields and Printer Attributes

Printer Definition Keyword	Printer Definition (or Component) Field Name	Printer Attribute (PIDU)
BURST	Allocation: Spool allocation values: BURST = 1 (Yes)	burster-trimmer-stacker
CHARS	Allocation: Resource Related Values: Character sets	chars
COPIES	Allocation: Other values: Copies	copies
COPYGRPS	Allocation: Other values: Copy group	copy-group
DATAFMT	NetSpool Options: Formatting: Record size	maximum-record-size
	NetSpool Options: Formatting = 2 (Standard)	netspool-formatting
	NetSpool Options: Formatting: RECFM	recfm
DEST	Allocation: Spool allocation values: DEST	destination
	Allocation: Spool allocation values: JES node	jes-node
DESTUSID	Allocation: Spool allocation values: DEST	destination
DPFNAME	Printer Definition: Processing	include-processing
EOFNAME	Printer Definition: NetSpool end-of-file	include-netspool-eof-rules
FCB	Allocation: Spool allocation values: FCB	forms-control-buffer
FLASH	Allocation: Spool allocation values: FLASH name	flash-name
FLASHCNT	Allocation: Spool allocation values: FLASH count	flash-count
HOLD	Allocation: Spool allocation values: HOLD	hold
LUCLASS	Printer Definition: LU classes	lu-classes
MODIFTRC	Not Applicable	(not supported)
MODIFY	Not Applicable	(not supported)
OUTPUT	Printer Definition: Allocation	include-allocation
PRINTERNAME	Printer Definition: NetSpool LU name	luname
SEGMENT	Allocation: Spool allocation values: SEGMENT	segment-pages
SYSOUTCL	Allocation: Spool allocation values: CLASS	output-class
SYSOUTFR	Allocation: Spool allocation values: FORMS	forms
SYSOUTWR	Allocation: Spool allocation values: WRITER	jes-writer
UCS	Allocation: Spool allocation values: UCS	universal-character-set

NetSpool OUTPUT Statements

The columns in Table 43 on page 174 contain the following information:

- The first column lists the parameter name in an OUTPUT JCL statement in a NetSpool startup procedure.
- The second column lists the corresponding ISPF panel field name in an Infoprint Server printer definition. The ISPF panel name precedes the field name.

- The third column lists the corresponding printer attribute used by the PIDU program.

Table 43. NetSpool OUTPUT JCL Statement Parameters to Infoprint Server ISPF Fields and Printer Attributes

OUTPUT JCL Statement Parameter Name	Printer Definition (or Component) Field Name	Printer Attribute (PIDU)
ADDRESS	Allocation: Values for Separator Pages: Address	address-text
BUILDING	Allocation: Values for Separator Pages: Building	building-text
BURST	Allocation: Spool allocation values: BURST = 1 (Yes)	burster-trimmer-stacker
CHARS	Allocation: Resource Related Values: Character sets	chars
CKPTLINE	Not Applicable	(not supported)
CKPTPAGE	Allocation: Other Values: Checkpoint pages	checkpoint-pages
CKPTSEC	Allocation: Other Values: Checkpoint seconds	checkpoint-seconds
CLASS	Allocation: Spool allocation values: CLASS	output-class
COLORMAP	Allocation: Other Values: Color map	color-map
COMPACT	Not Applicable	(not supported)
COMSETUP	Allocation: Other Values: Com setup member	com-setup-member
CONTROL	Not Applicable	(not supported)
COPIES	Allocation: Other Values: Copies	copies
	Allocation: Other Values: Copy group	copy-group
DATACK		
UNBLOCK	Allocation: Error Reporting Values: Print error reporting = 2 (All)	print-error-reporting = all
BLOCK	Allocation: Error Reporting Values: Print error reporting = 1 (None)	print-error-reporting = none
BLKCHAR	Allocation: Error Reporting Values: Print error reporting = 4 (Position)	print-error-reporting = position
BLKPOS	Allocation: Error Reporting Values: Print error reporting = 3 (Character)	print-error-reporting = character
DEFAULT	Not Applicable	(supported, but does not map to attribute)
DEPT	Allocation: Values for Separator Pages: Department	department-text
DEST	Allocation: Spool allocation values: DEST	destination
	Allocation: Spool allocation values: JES node	jes-node
	Protocol: Printer IP address	printer-ip-address
DPAGELBL	Allocation: Other Values: Label data pages	label-data-pages
DUPLEX		
NO	Allocation: Other Values: Duplex = 1 (Simplex)	duplex = no
NORMAL	Allocation: Other Values: Duplex = 2 (Duplex)	duplex = yes
TUMBLE	Allocation: Other Values: Duplex = 3 (Tumble)	duplex = tumble
FCB	Allocation: Spool allocation values: FCB	forms-control-buffer

Table 43. NetSpool OUTPUT JCL Statement Parameters to Infoprint Server ISPF Fields and Printer Attributes (continued)

OUTPUT JCL Statement Parameter Name	Printer Definition (or Component) Field Name	Printer Attribute (PIDU)
FLASH	Allocation: Spool allocation values: FLASH count	flash-count
	Allocation: Spool allocation values: FLASH name	flash-name
FORMDEF	Allocation: Resource Related Values: Form definition	form-definition
FORMLEN	Allocation: Other Values: JES form length	jes-form-length
FORMS	Allocation: Spool allocation values: FORMS	forms
FSSDATA	Not Applicable	(not supported)
GROUPID	Allocation: Spool allocation values: GROUPID	group-identifier
INDEX	Not Applicable	(not supported)
INTRAY	Allocation: Resource Related Values: Input tray	input-tray-number
JESDS	Not Applicable	(not supported)
LINDEX	Not Applicable	(not supported)
LINECT	Allocation: Spool allocation values: LINECT	jes-maximum-line-count
MODIFY	Not Applicable	(not supported)
NAME	Allocation: Values for Separator Pages: Name	name-text
NOTIFY	Allocation: Other Values: Notify	notify
OFFSETXB	Allocation: Resource Related Values: Image shift x-direction back	x-image-shift-back
OFFSETXF	Allocation: Resource Related Values: Image shift x-direction front	x-image-shift-front
OFFSETYB	Allocation: Resource Related Values: Image shift y-direction back	y-image-shift-back
OFFSETYF	Allocation: Resource Related Values: Image shift y-direction front	y-image-shift-front
OUTBIN	Allocation: Resource Related Values: Output bin	output-bin-number
OUTDISP	Allocation: Spool allocation values: OUTDISP	normal-output-disposition
OVERLAYB	Allocation: Resource Related Values: Overlay Back	overlay-back
OVERLAYF	Allocation: Resource Related Values: Overlay front	overlay-front
OVFL	Not Applicable	(not supported)
PAGEDEF	Allocation: Resource Related Values: Page definition	page-definition
PIMSG	Allocation: Error Reporting Values: Error disposition: Print error messages (selected)	print-error-messages
	Allocation: Error Reporting Values: Error disposition: Print error messages: Maximum messages	print-error-messages-maximum
PORTNO	Protocol: Port number	port-number
PRMODE	Allocation: Spool allocation values: PRMODE	process-mode

Table 43. NetSpool OUTPUT JCL Statement Parameters to Infoprint Server ISPF Fields and Printer Attributes (continued)

OUTPUT JCL Statement Parameter Name	Printer Definition (or Component) Field Name	Printer Attribute (PIDU)
PRTERROR	Allocation: Error Reporting Values: Error disposition	error-disposition
PRTOPTNS	Printer Definition: IP PrintWay options	include-printway-options
PRTQUEUE	Protocol: Print queue name	print-queue-name
PRTY	Allocation: Spool allocation values: PRTY	jes-priority
RESFMT	Allocation: Other Values: Resolution	resolution
RETAINF	IP PrintWay Options: Retention period: Failure	failure-retention-period
RETAINS	IP PrintWay Options: Retention period: Successful	successful-retention-period
RETRYL	IP PrintWay Options: Retry limit	retry-limit
RETRYT	IP PrintWay Options: Retry time	retry-time
ROOM	Allocation: Values for Separator Pages: Room	room-text
SYSAREA	Allocation: Other Values: Restrict printable area	restrict-printable-area
THRESHLD	Allocation: Spool allocation values: THRESHLD	jes-threshold
TITLE	Allocation: Values for Separator Pages: Title	title-text
TRC	Allocation: Other Values: Restrict printable area: Tables reference characters (selected)	table-reference-characters
UCS	Allocation: Spool allocation values: UCS	universal-character-set
USERDATA	Allocation: Spool allocation values: USERDATA	userdata
USERLIB	Allocation: Resource Related Values: Resource library	resource-library
WRITER	Allocation: Spool allocation values: WRITER	jes-writer

NetSpool Page-Format Table

The columns in Table 40 on page 169 contain the following information:

- The first column lists macro keywords used to create the NetSpool page-format table.
- The second column lists the corresponding ISPF panel field name in an Infoprint Server printer definition. The ISPF panel name precedes the field name.
- The third column lists the corresponding printer attribute used by the PIDU program.

Table 44. NetSpool Page-Format Table Keywords to Infoprint Server ISPF Fields and Printer Attributes

Page-Format Entry Keyword	Printer Definition (or Component) Field Name	Printer Attribute (PIDU)
BM	Processing: NetSpool SCS-to-Line Conversion: Margins: Bottom	scs-bottom-margin
HT	Processing: NetSpool SCS-to-Line Conversion: Tabs: Horizontal	scs-horizontal-tabs
LM	Processing: NetSpool SCS-to-Line Conversion: Margins: Left	scs-left-margin
MPL	Processing: NetSpool SCS-to-Line Conversion: Page length	scs-maximum-page-length
MPP	Processing: NetSpool SCS-to-Line Conversion: Line length	scs-maximum-line-length
RM	Processing: NetSpool SCS-to-Line Conversion: Margins: Right	scs-right-margin
TM	Processing: NetSpool SCS-to-Line Conversion: Margins: Top	scs-top-margin
VT	Processing: NetSpool SCS-to-Line Conversion: Tabs: Vertical	scs-vertical-tabs

Note: The migration program creates a V2R8 processing component for each V2R5 page format table entry.

Appendix C. Accessibility

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use software products successfully. The major accessibility features in z/OS enable users to:

- Use assistive technologies such as screen-readers and screen magnifier software
- Operate specific or equivalent features using only the keyboard
- Customize display attributes such as color, contrast, and font size

Using Assistive Technologies

Assistive technology products, such as screen-readers, function with the user interfaces found in z/OS. Consult the assistive technology documentation for specific information when using it to access z/OS interfaces.

Keyboard Navigation of the User Interface

Users can access z/OS user interfaces using TSO/E or ISPF. Refer to *z/OS TSO/E Primer*, *z/OS TSO/E User's Guide*, and *z/OS ISPF User's Guide Volume I* for information about accessing TSO/E and ISPF interfaces. These guides describe how to use TSO/E and ISPF, including the use of keyboard shortcuts or function keys (PF keys). Each guide includes the default settings for the PF keys and explains how to modify their functions.

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This section lists publications that may be helpful to you as you configure and use Infoprint Server.

Infoprint Server

Title	Order Number
Infoprint Server Transforms Licensed Program Specifications	G544-5797
z/OS Infoprint Server Customization	S544-5744
z/OS Infoprint Server Introduction	S544-5742
z/OS Infoprint Server Messages and Diagnosis	G544-5747
z/OS Infoprint Server Migration	G544-5743
z/OS Infoprint Server Operation and Administration	S544-5745
z/OS Infoprint Server User's Guide	S544-5746
Infoprint Server for z/OS Implementation Redbook	SG24–6234

Print Services Facility™ for OS/390

Title	Order Number
AFP Conversion and Indexing Facility: User's Guide	S544-5285
PSF for OS/390 & z/OS: Customization	S544-5622
PSF for OS/390 & z/OS: Diagnosis	G544-5623
PSF for OS/390 & z/OS: Download for OS/390	S544-5624
PSF for OS/390 & z/OS: Introduction	G544-5625
PSF for OS/390 & z/OS: Messages and Codes	G544-5627
PSF for OS/390 & z/OS: User's Guide	S544-5630

Advanced Function Presentation (AFP)

Title	Order Number
IBM Printing Systems: Printer Information	S544-5750
IBM Printing Systems: Printer Summary	S544-5749
AFP: Programming Guide and Line Data Reference	S544-3884
IBM AFP Fonts: Font Summary for AFP Font Collection	S544-5633
IBM AFP Fonts: Font Summary for AFP Font Collection	S544-5633
IBM Data Stream and Object Arcitectures: Bar Code Object Content Architecture Reference	S544–3766
IBM Data Stream and Object Arcitectures: IOCA Reference	SC31–6805
IBM Page Printer Formatting Aid: User's Guide	S544-5284

Infoprint Manager for AIX and Windows

Title	Order Number
IBM Infoprint Color 130 Plus Installation Planning Guide	G544-5771
IBM Infoprint Manager: Reference	S544-5475
IBM Infoprint Manager for AIX: Administrator's Guide	S544-5595

z/OS Version 1 Release 2

Title	Order Number
z/OS C/C++ Programming Guide	SC09-4765
z/OS C/C++ Run-Time Library Reference	SA22-7821
z/OS Communications Server: IP and SNA Codes	SC31-8791
z/OS Communications Server: IP Application Programming Interface Guide	SC31-8788
z/OS Communications Server: IP Configuration Guide	SC31-8775
z/OS Communications Server: IP Configuration Reference	SC31-8776
z/OS Communications Server: IP Migration	GC31-8773
z/OS Communications Server: SNA Diagnosis Vol 1 Techniques and Procedures	LY43-0088
z/OS Communications Server: SNA Diagnosis Vol 2 FFST Dumps and the VIT	LY43-0089
z/OS Communications Server: SNA Messages	SC31-8790
z/OS Communications Server: SNA Network Implementation Guide	SC31-8777
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z/OS Distributed File Service SMB Administration	SC24-5918
z/OS Information Roadmap	SA22-7500
z/OS ISPF Dialog Developer's Guide and Reference	SC34-4821
z/OS JES2 Commands	SA22-7526
z/OS JES2 Initialization and Tuning Guide	SA22-7532
z/OS JES2 Initialization and Tuning Reference	SA22-7533
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z/OS Language Environment Debugging Guide	GA22-7560
z/OS Language Environment Run-Time Messages	SA22-7566
z/OS Language Environment Programming Guide	SA22-7561
z/OS MVS Diagnosis: Tools and Service Aids	GA22-7589
z/OS MVS Initialization and Tuning Guide	SA22-7591
z/OS MVS Initialization and Tuning Reference	SA22-7592
z/OS MVS JCL Reference	SA22-7597
z/OS MVS Product Management	SA22-7603

Title	Order Number
z/OS MVS Programming: Authorized Assembler Services Reference ALE-DYN	SA22-7609
z/OS MVS Programming: Authorized Assembler Services Reference ENF-IXG	SA22-7610
z/OS MVS Programming: Authorized Assembler Services Reference LLA-SDU	SA22-7611
z/OS MVS Programming: Authorized Assembler Services Reference SET-WTO	SA22-7612
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z/OS SDSF Operation and Customization	SA22-7670
z/OS Security Server RACF General User's Guide	SA22-7685
z/OS Security Server RACF Security Administrator's Guide	SA22-7683
z/OS Summary of Message Changes	SA22-7505
z/OS UNIX System Services Command Reference	SA22-7802
z/OS UNIX System Services Messages and Codes	SA22-7807
z/OS UNIX System Services Planning	GA22-7800
z/OS UNIX System Services User's Guide	SA22-7801

CICS®

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CICS Customization Guide	SC34-5706
CICS Diagnosis Reference	LY33-6097
CICS Resource Definition Guide	SC34-5722
CICS Supplied Transactions	SC34-5724

IMS/ESA® Version 6

Title	Order Number
IMS/ESA Administration Guide: System	SC26-8730
IMS/ESA Administration Guide: Transaction Manager	SC26-8731

3270 and SNA Data Streams

Title	Order Number
IBM 3270 Information Display System Data Stream Programmer's Reference	GA23–0059
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